KEYFRAME MAGAZINE

THE PUBLICATION FOR LIGHTWAVE, INSPIRE, AND AURA ENTHUSIASTS

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Virtual Angus

as seen on VH-1!

MotionBlender

VideoToasterNT

Surviving Your Studio's Growing Pains

Radiosity

Dirt

Place with computer magazines

Issue #20 January/February 2001
$9.95 US $14.95 Canada

Why Wait?

Some things are meant for each other. LightWave [6.5] and Apple's incredibly powerful G4 workstations are a perfect example. LightWave's multi-threaded code takes full advantage of Apple's G4 dual-processor workstations, and LightWave [6.5] also provides unprecedented Open GL support for lightning fast performance. As if this wasn't enough, LightWave [6.5] has optimization for the Velocity Engine. LightWave [6.5] is available now for Mac OS 9 and Mac OS X Public Beta. Anyone running LightWave [6] for Macintosh can download the preview release of LightWave for Mac OS X Public Beta today, and will be able to download the final release of LightWave [6.5] for Mac OS X once it is available - free of charge!

What are you waiting for? Contact NewTek at 1-800-TOASTER to locate the nearest NewTek authorized reseller or visit www.lightwave6.com to learn more about LightWave [6.5] for the Macintosh.

LightWave [ ]

NewTek

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KEYFRAME MAGAZINE

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The Secret Formula
Keyframe Magazine is created using Quark 4.1, Photoshop 5.0, LightWave 6.0, and various plug-ins.

No dongles were harmed in the making of this publication.

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EDITORIAL

YES, WE'RE STILL HERE!

As some of you have noted, this issue of Keyframe is several months late. We appreciate your patience, and we hope future issues will be adequate reward for it. The last half of 2000 was the toughest time so far for this magazine, for reasons only partly within our control. The good news is, as Nietzsche wrote, "That which does not kill us, makes us stronger." Keyframe is alive and well, and looking forward to great things in the new millenium.

Many changes, good and bad, have been happening throughout the LightWave community. LightWave is still growing and improving, and it is still being used in many studios. Third-party support is still strong, and while some publishers have left the LightWave community, others have been creating powerful new products for us. Finally, as Steve Pugh notes in this issue's Final Cut column, LightWave studios have been merging, closing, or expanding, depending on market forces and management.

LightWave users, including our contributors, have also been keeping busy. So busy, in fact, that one of Keyframe's biggest problems in late 2000 was catching our contributors outside of crunch mode. LightWave artists with both talent and experience are being deluged with work. Unfortunately, that means some of our longest-running contributors have moved up to bigger and better things, and they simply don't have the time to write for us any more. While we'll miss them, the good news is that the incoming crop of contributors looks very promising.

Another challenge has been finding the resources - not just in money, but in time and talent - to keep Keyframe going. I'm happy to report (and I hope you'll be happy to hear) that this set of problems is solved. DMG Publishing has new owners, Charles and Alice Edgin, and they will be bringing some much-needed changes to the business side of Keyframe's operations.

Some of you may have already met Alice, through her handling of subscription and database issues this past year. She has done a marvelous job of sorting through the debris of our spring 2000 database meltdown, cleaning out spurious data and replacing lost data by reprocessing our paper records. Alice is now keeping all subscriptions and other business transactions up to date and in order, so you can expect fast, professional service on any of your Keyframe-related business queries.

The most important changes are those you won't see or notice. We hope that you'll have fewer or no reasons to complain of late or missing issues, either by subscription or on the newsstands. As of this issue, Keyframe is back on bimonthly status. We'll be adding advertisers, but we'll also be increasing the total page count so you'll still be getting the same quantity (or more) of tutorials, features and news. The website is finally getting the attention it requires, so your online subscriptions will be processed accurately and the support files for previous and future issues' tutorials will be available for download.

One thing that won't be changing: I have agreed to stay on as Editor as long as you readers still want me here. My name is still at the top of the masthead, and the buck still stops here. If you have any questions, suggestions or problems, I want to hear them.

Doug Kelly

Ear to the Wall

News from the LightWave arena

LIGHTWAVE-BASED FX SCHOOL OPENS AT UNIVERSAL STUDIOS FLORIDA

Former Foundation Imaging Animation Supervisor Jeff Scheetz is proud to announce the opening of The Digital Animation & Visual Effects School, also know as The DAVE School.

The DAVE School offers a one-year Associates Degree program specifically designed to prepare students for a career in the visual effects industry. In addition to software training, the curriculum includes animation history, design theory, and computer science. The school will also host a variety of effects industry instructors and guest speakers.

"The great thing about having the school at Universal will be shooting on the stages and back lot." Scheetz continues, "We have assignments that give each student a chance to supervise element photography for effects shots they will complete in our lab."

The school's computer lab features 20 dual 800mhz workstations, each with a Video Toaster NT. Other assets include a motion capture stage, workshop, and theater. Financial aid and aggressive placement service are also provided. For more information, go to:

www.daveschool.com

FREE Chrome Cow Coolware

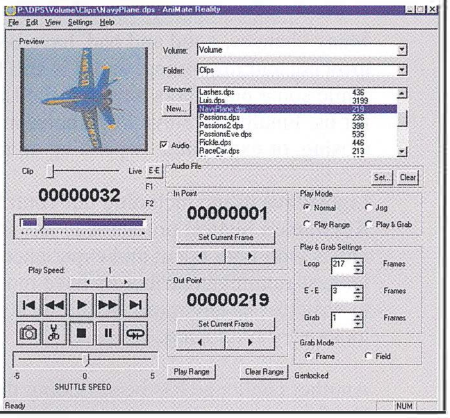
Sean Moyer, host of the Chrome Cow website and a past contributor to this magazine, has finally released all his "Coolware" plug-ins as freeware. As he said in his announcement, many have not been tested with L[6] but you may find Sean's **Dial Tricks**, **Grouper**, **Designer/Geek Color Translator**, **Surface Master**, **File Herder** or **Production Assistant** useful (not to mention all the previously free ones, especially **Long Lunch**).

DPS AniMate

DPS' AniMate stop-frame animation software is now available for use with the dpsReality Studio Digital Disk Recorder (SDDR)™ and dpsVelocity non-linear editing system. AniMate is designed to enable stop-frame animators to build up animations quickly and easily. With DPS AniMate, dpsReality and dpsVelocity can be used as stop-frame video assist or direct-to-disk systems. Previous versions of DPS AniMate, for the DPS Perception Video Recorder® (PVR) and DPS Hollywood Video Recorder®, have been used in productions from Aardman Animations, Cosgrove Hall Productions and many other companies. 35 DPS AniMate/PVR systems were used by Aardman on their first full-length animated feature, last summer's hit film *Chicken Run*.

Registered owners of dpsReality and dpsVelocity can download the new DPS AniMate software from the DPS web site.

www.dps.com



P:\DPS\Volume\Clips\NavyPlane.dps - AniMate Reality

Volume: Volume
Folder: Clips
Filename: NavyPlane.dps 219

Lashes.dps	436
Luis.dps	3199
NavyPlane.dps	219
Passions.dps	236
Passions2.dps	398
PassionsEve.dps	535
Pickle.dps	446
RaceCar.dps	213

☑ Audio
00000032
In Point: 00000001
Out Point: 00000219
Play Speed: 1
Play Mode: ● Normal ○ Jog ○ Play Range ○ Play & Grab
Play & Grab Settings: Loop 217 Frames; E-E 3 Frames; Grab 1 Frames
Grab Mode: ● Frame ○ Field
Genlocked
Ready

Shadow Designer

Shadow Designer is an image-based soft shadow renderer for Lightwave. Independence of LW lights gives you total control over the placement, intensity, color, and softness of your shadows. Shadow Designer gives you the ability to simulate smooth area light shadows quickly.

Shadow Designer simulates soft shadows from user-defined light sources. It traces a shadowmap, convolutes it, and applies it to the image. By modifying different settings like convolution size, distance falloff, and number of light sources, you can easily design any kind of shadow.

Shadow Designer consists of 3 plugins: a shader through which the shadow map is traced; pixel filter; and image filter. Because Shadow Designer is an image-based renderer, render times depend only on the screen resolution and soften amount, and are independent of the scene complexity.

Evasion Ltd.
http://www.evasion-studio.com/3d/
Shadow Designer v1.0 for Intel platform
LW version: 6.0 and 6.5
Price: $69
Available from Safe Harbor

Note: This product is delivered electronically.

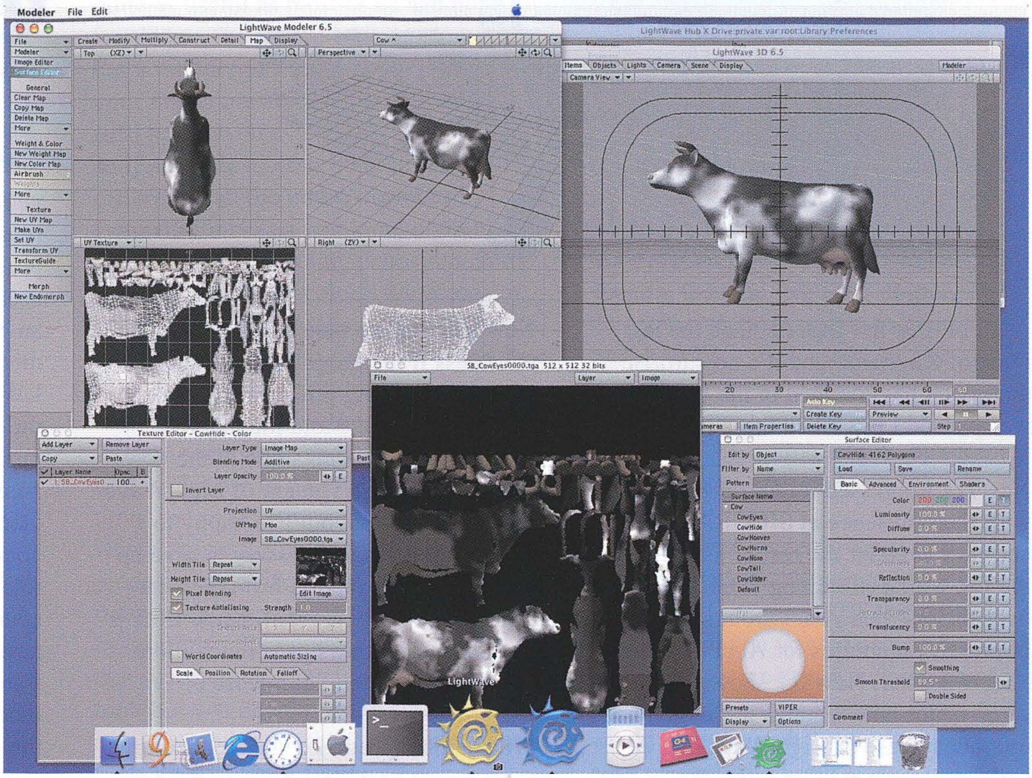
NewTek Releases First Professional 3D Application for OS X

NewTek is proud to announce the availability of the first professional 3D application for OS X.

A preview release of LightWave [6.5] for Apple's OS X is available for immediate download. All registered Macintosh LightWave 6.0 and 6.5 users can download this special version.

Be one of the first to welcome the introduction of Apple's next generation operating system, with the next level in animation software, LightWave 6.5!

Please remember that this is a preview release of software for a beta operating system, so there will be no support for this product at this time.


Modeler File Edit
LightWave Modeler 6.5
LightWave 3D 6.5
Texture Editor - CowHide - Color
SB_CowEyes0000.tga 512 x 512 32 bits
Surface Editor

http://www.newtek.com/products/lightwave/downloads/patches/macintosh/lw65_mac_osx_preview.html

NewTek Releases Aura 2

NewTek Inc. announced that Aura 2 is shipping and available. This long-awaited upgrade to the Aura 1 Video Paint System boasts a new feature set and a complement of new tools. Aura 2 has been written to provide increased interactivity with all other NewTek products, especially LightWave 3D 6.5.

" I can mess with 3 different packages to get my work done. This one only paints. This one will only composite. But you need a third for true 2D animation. Who needs that? With Aura 2, it's all right there in front of me." said Terrence Walker, of Westwood Studios. "With features like multiple projects, multiple undo, pixel tracking and the new keyframer, Aura 2 is my new tool of choice."

A Multitude of New Features

Aura has always offered a strong feature set at a great price point. Aura 2 gives you far greater power and speed than any standard paint program through the following additions:

- Super fast painting engine
- Interactive keyframer on X, Y, Z, and P, H, B axis making Aura 2 a 2fi D Animation System
- Works in any size or resolution from computer to film and beyond
- Natural media simulation brushes and painting surfaces
- Fully animatable 32 bit paint brushes (animbrush) for painting with video and more
- Up to 4-point pixel tracking with the ability to average and smooth the track
- Full QuickTime support including audio
- Ability to export Aura 2 motion paths to LightWave 3D 6.0/6.5
- Unlimited Undo
- Unlimited Layers with real-time Alpha channels
- Audio support with real-time scrub within the project
- Multiple projects with ability to cut and paste layers between projects
- Includes NewTek's Vidget file format conversion utility for creation of MPEGs and more
- Stroke recorder to capture brush strokes and reproduce them over time
- Timeline based editing environment for video painting, animation and sound
- Enhanced scripting power cuts hours off production time and adds flexibility and speed

LightWave 6.5, TextureMotion, B

by David Warner

A lot of time has passed since the last issue of Keyframe and it's no surprise that much has changed in the LightWave world since I last filled these pages.

NewTek impressed a LOT of people with their presence at SIGGRAPH 2000, and they even let the rest of us get in on the fun with a streaming video broadcast over the internet. Aside from some really impressive upgrades for Aura and the Video Toaster, NewTek showed off some major new features in the planned upgrade release of LightWave 6.1. A built-in particle system and soft-integrated soft-body dynamics were two of the more exciting features demonstrated in L6.1 but there were plenty of other cool things to get excited about, not the least of which was a scheduled released date of "late September-early October".

Time passed and so did the L6.1 scheduled release date. Just when people started getting a little antsy about not receiving their free L6.1 update, NewTek surprised us all again with the announcement that there would not be a free L6.1 update, but instead, the new version would be LightWave 6.5 and, yes, it would still be free. The reasons for this change in version numbers is not important because the lengthened features list is impressive enough to make everyone forget about the missed release date, especially when you consider that this new version was in the hands of beta-testers before the end of October. By early December a significantly improved L6.5 beta version was released for a "Public Beta" testing phase, available to all L6 owners.

New features are nice but they are also worthless if the program is not stable, and this was a big problem with L6. Many people have told me that they would gladly give up some of the new features to have a version of LightWave that doesn't crash, but I'm happy to report that it's not necessary to give up anything. Early reports from the beta-tester community are that, while L6.5 is not without its flaws, it is much more reliable than the initial release of L6.

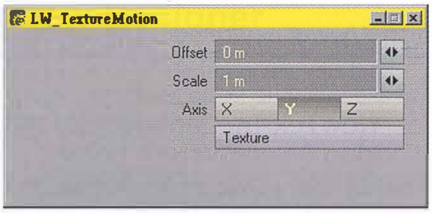
What about speed? L6 suffered from some major problems when it came to performance. In fact, I know many people who used L6 for a few weeks and then went back to using LightWave v5.6 when they experienced the slower render times in L6. However, the LightWave programming team appears to have scored big in the code optimization game and the overall performance of L6.5 is significantly improved. Not only are benchmark render times faster than LW v5.6, but the interface response time is blazing fast now, especially with "layered" features that were painfully slow in L6, like using Inverse Kinematics on bone hierarchies with weight maps applied.

The bottom line is that LightWave 6.5 is shaping up to be a must-have upgrade, and is finally something that I can strongly recommend to all LightWave users. If you are still using LightWave v5.6 (or an older version) and you were hesitant to take the L6 plunge, then I say dive in because L6.5 has changed everything! Kudos to the LightWave programmers for doing so much in so little time!

Here is this issue's batch of questions and answers from the LightWave mailing list...

Q How can I make a vehicle travel over a bumpy terrain that I've created with displacement maps?

A Something like this would have been fairly difficult with older versions of LightWave. With L6, it is a relatively simple matter to take the same procedural texture or image map that you used to create the terrain, and apply it as an "altitude" texture to make the vehicle move only on the Y axis. The LW_TextureMotion plug-in gives you the ability to do this and with just a few mouse clicks you can have a vehicle that automatically rises and falls as it travels along the surface of the terrain. Of course, you would still need to keyframe rotational changes so that the vehicle actually "sticks" to the surface of the terrain, but with L6's multi-channel keyframe features, it is a snap to make independent changes to each channel of the vehicle's movements.



LW_TextureMotion

Offset 0 m

Scale 1 m

Axis X Y Z

Texture

Figure 1 The TextureMotion plug-in will allow you to control the movement or shape of an object with any texture.

Q In L6, when I make a change to an object and then replace the old object with the new one, some of the layered changes do not get loaded...why?

A One major change in the object file format that has occurred with L6 is that object layers are kept separate when an object is loaded into Layout. This means that you do not have to "flatten" your objects in Modeler before they can be animated and it also provides a lot more power and flexibility for complex animation tasks, where you can apply effects to one layer of an object without affecting other layers.

This is a big improvement over the old

way LightWave handled objects, but it means that the scene files are now a bit more complex than they used to be. If you look closely at a L6 scene file, you will notice that objects are loaded into a scene layer by layer, so if an object has 10 different layers in it, there will be 10 separate load commands to load that complete object into Layout. This opens up the possibility for an object loading problem if you change the number of layers in an object without properly updating the scene file. For instance, if you modified the example object with 10 layers by adding or removing layers, the scene file has no way of knowing that the number of layers in that object has changed. When you reload that scene file, you may "lose" changes that you've made to the object. The changes will still be present in the object, but the scene file that Layout loads in may not load all of the layers needed to completely load the new object.

Fortunately, LightWave does provide its own solution in the form of the Hub. If you make sure that the Hub is running correctly and that the "Synchronize With Layout" option is activated in Modeler, then any changes you make to the object will automatically be applied to the scene file currently loaded into Layout. Many people have complained about the Hub's stability in older versions of L6, but with the release of L6.5 this system seems to be much more reliable. Once you become comfortable with the way the Hub works, you will likely find it to be one of the "must-have" features in L6.5 that you will wonder how you ever got by without.

If the Hub does prove to be unreliable, then a "backup" solution is to simply delete the modified object from your scene file and then reload it back into the scene. Of course, if you have a parent-child hierarchy setup that involves this modified object then this can be an awkward or downright impossible solution.

Q What are the rules and limitations of the Symmetry tool? Sometimes it works great and other times it won't work at all. Why is that?

A The Symmetry function is one of the few L6 features that is not quite as useful as most of us had hoped it would be. The reason is that Symmetry has a number of limitations; for one, your object must be absolutely symmetrical before you even apply the function, so if one side of your object is slightly different than the other, then the symmetry tool just won't do anything. Another annoying thing about symmetry is that it only works along the X axis of your object. This makes it difficult to symmetrically model an object along the Y or Z axes, but a few rotate operations will provide a work-around. One of the biggest complaints about the symmetry tool is that it will only work with modify tools and some of multiply operations, which prevents you from symmetrically modeling an object point-by-point, polygon-by-polygon, or even primitive-by-primitive. Of course the solution to this shortcoming is to use the Mirror tool, but you need to make sure the resulting object is 100% symmetrical on both sides of the X axis.

Q I've heard a number of complaints that the render times in LightWave 6.0 have gone up significantly over the render times in LightWave 5.6, is this true, and if it is, why?

A LightWave 6.0 and the first patch, 6.0b, were much slower than version 5.6 when it came to ray-tracing and other render-intensive features. The reasons for this are varied, but the bottom line is that L6 has a lot more features than LW5.6 and, therefore, there were a lot more things that the render engine had to keep track of. Many people still grumble over the fact that the newer version of LightWave is slower than the old version, but one thing you need to keep in mind is that LightWave 6.0 is still under development and many things are still being improved, including render speeds.

The recently-released L6.5 upgrade will add many cool new features to LightWave, but more importantly, it goes a long way toward speeding up render times. In the L6.5 Beta version, ray-tracing times have been dramatically improved and the addition of some advanced ray-tracing optimization options cut render times even further. At this point, the render times in L6.5 are slightly faster than the render times of LW5.6 and this is with all of the added features and improved image quality of the L6.5 render engine. Bottom line is this, if the slow render times of L6.0 were preventing you from using the new version, then the free L6.5 upgrade will give you one more reason to make the switch to L6.

Q How can I convert my old LightWave 5.6 morph target objects into L6 endomorph objects?

A In LightWave 6.5, NewTek has provided a nifty little Modeler tool called "BKG-to-MORPH" that will do exactly what you want. The way it works is you load or create the endomorph base object into an empty Modeler layer...this would be the morph "source" object you have created with LightWave 5.6. Then you simply load the morph target object into another layer and select that layer as the background layer for your endomorph base object.

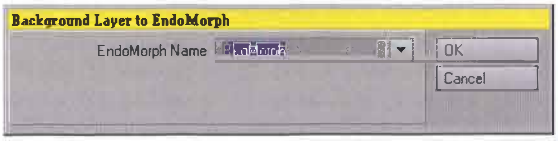


Figure 2 *The Bkg-To-Morph tool will allow you to quickly convert L W5.6 morph targets into L6.5 endomorph targets.*

Now you can go to the "Map" tab in Modeler and run the "BKG-to-MORPH" function. This simple tool will prompt you to name the new endomorph target, and that's all there is to it. Repeat these operations for each morph target object and when you're all done, the endomorph base object that is loaded in the foreground layer will have multiple endomorph target objects that are pulled in from each of the background layers. This is a relatively painless process, allowing you to convert your old morph targets into endomorphs, which are significantly more powerful than the object morphing features found in older

Continued on page 18

Global Illumination 101

by Phil South

Radiosity in LightWave is just a fire and forget missile, a button you just hit and it goes, right? Well, no. In fact the most welcome addition of the Global Illumination panel in LightWave [6] is both a blessing and curse, like the old Chinese saw about "may you live in interesting times." Working with Global Illumination can make hours seem like weeks, and if you turn all the options full on, then weeks is what you spend rendering. I've spent a bit of time playing with radiosity in particular, and while it simply works most of the time, there are some finer points of the settings that are worth discussing.

Just Because You Can

First point: Why? Radiosity is a good thing, so why not use it all the time? Well, you could, but it might not be the best thing for your scene. Radiosity raises the render times and often doesn't produce the effect you were looking for. You might get a better result by using extra lights in the scene, which also gives you a more controllable light.

So don't spray radiosity over every scene you render just because you can. Just because you can do something, doesn't mean you always should (which is a lesson for life, never mind 3D work). As with any process or technique in LightWave, you should judge its appropriateness on a shot-by-shot basis. If the scene has a long render time anyway, don't compound the problem by loading it with radiosity calculations. If you are only rendering stills at print resolution, then radiosity becomes more cost effective from a processing standpoint.

There are certain lighting schemes where radiosity just looks horrible; there are some where it actually works against you. In these circumstances, sometimes the only way to make it look good is to rack up the processing time by turning everything on. Like country music, loud psychedelic loon pants and Denis Leary, there are times when certain things aren't appropriate.

If you're contemplating radiosity-enhanced animation, then you have to proceed very carefully indeed. Radiosity performs very differently across a series of frames, which is a subject that we'll go into another time.

Back to Basics

So let's get a room. No, I don't want to be alone with you, I want to make a simple room to shine light around. Using complex scenes with many colored backgrounds and shaders is the wrong way to demonstrate any kind of lighting effects. The best way to play with lighting set-ups is in a plain white room; that way you can see where all the light goes.

For this project, I want to set up a couple of "baffles" or short walls to bend the light around. The theory goes like this: if radiosity works the same way as it does in the real world (whatever that is), I can put a couple of walls through a plain white room with a gap between them and above them, and the light will spill around the baffles/walls and light what's behind them. So much for theory, what about the practice?

I built a room 4m long by 2.5m high by 2.5m deep. Inside that, I put a couple of 1.8m square walls, of about 100mm thickness, which intersect the walls of the room on the sides and the floor but leave a gap at the top. This way light can spill around the walls over the tops and through the middle gap. I also resized the Triceratops (I couldn't bring myself to use the cow) to fit it in front of the wall on the right. I also flipped the polygons on the room itself so we can see into the room and the light can hit the inside of the room.

Once this is built you can load it all into Layout.

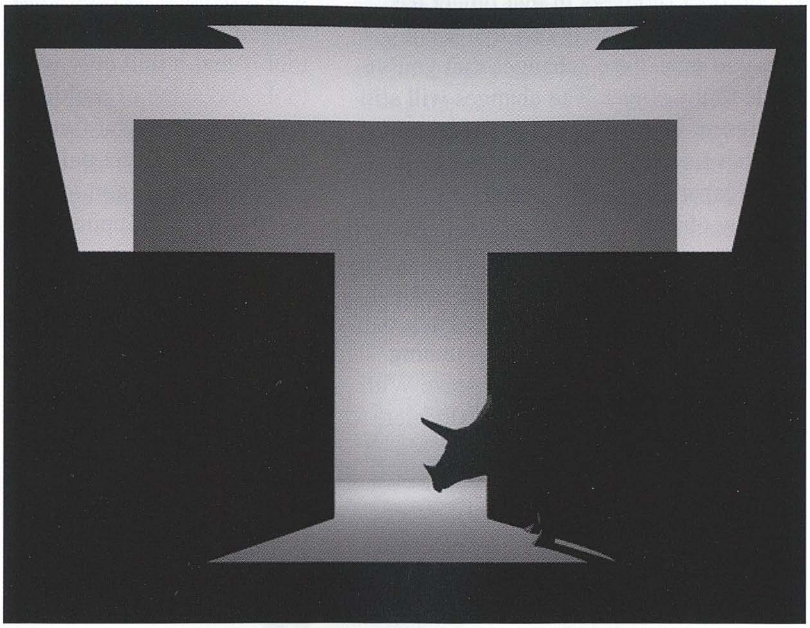


Figure 1: Point light, no ambient and no radiosity.

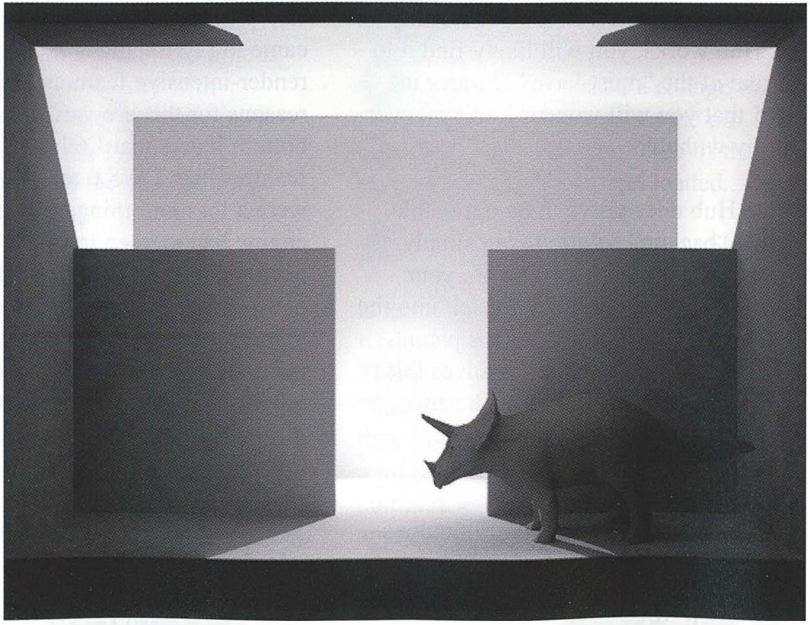


Figure 2: Radiosity turned on.

Thrills and Spills

The final bit of set-up is to turn the default light into a point light and move it to the back of the room. You can turn off all ambient light (a good strategy most of the time when you are going for a good lighting set-up), turn on ray traced shadows and go for a render. I used a picture size of 627x481 and high antialiasing. You should get something that looks like Figure 1. The light is bright and harsh with no shadow detail at all, like a nuclear flash bulb. All the areas of shadow are jet black holes in the picture and this is what you usually get unless you add extra lights.

The next step is to open the Global Illumination panel and turn on Radiosity. Now if you've read your manual, you'll find out what Tolerance means. Basically, this is a sort of radiosity version of adaptive sampling. You can rack it up to decrease render times, but the result you get is less than perfect. I set the picture size to 627x481 again, and high antialiasing, but this time I set a tolerance of 0.1, a Rays Per Evaluation (RPE) of 10x30 and a Minimum Evaluation Spacing (MES) of 10mm. The default Tolerance is 0.3, so 0.1 gets the render time down but improves quality. The RPE and MES settings are a little bit higher quality than the defaults of 8x24 and 20mm. If we render again with radiosity turned on, it takes about 10 minutes as opposed to the original render that took 9 seconds on my Pentium III 700MHz. You should get something that looks like Figure 2.

Now something really cool is happening. The light from the point source is fanning out in all directions, but where before it was stopping dead when it hit the walls, now it's bouncing around the walls and lighting almost every surface. The Triceratops is more clearly revealed, and there is light splashing down the backs of the baffles, reflected from the walls we can't see in the front of the room. (Single-sided walls are like two-way mirrors in police shows on TV.)

At first this looks really cool, but then you notice a sort of fluffy effect on the shading on the walls. This is your tolerance setting giving its best guess about the shading on the walls. It looks okay at a glance, but your first feeling is probably that you can do better than that. If you turn the Tolerance down to 0, the MES setting ghosts out as you are using FULL radiosity. This render will take a little longer, but the quality will be superb. How much longer? On the Pentium III I mentioned before, the same picture at the same size took 54 minutes and 50 seconds. The fluffiness is gone, as shown in Figure 3, but you pay a penalty in render times.

Figure 3: Full radiosity.

Sci-Fi Light Panels

Okay, so radiosity works, but you have to tailor your settings to the scene. With some scenes you can get away with adding a little carefully chosen tolerance setting to reduce the render time. If your surfaces are highly textured, you can get away with a little fluffiness. But what about the other feature of radiosity, the ability to make self-illuminated surfaces actually cast light?

If we turn off the point light by reducing its value to 0%, then set the luminosity of the two baffle walls to 100% and use the tolerance level of 0.1 again, we get an effect like Figure 4. It's a really cool effect, and I have no idea how many hours it would take to render at FULL radiosity, but it's not bouncing enough light around. Why? The luminosity is only set to 100%. Set it higher, like 150% or even 300% and the light cast by the illuminated surfaces is even brighter and starts to really bounce around inside the room. Figure 5 has the luminosity set to 300%.

That's cool, but our Triceratops isn't really standing out, even at 300%. What if we make the room ceiling into one big light?

Continued on Page 29

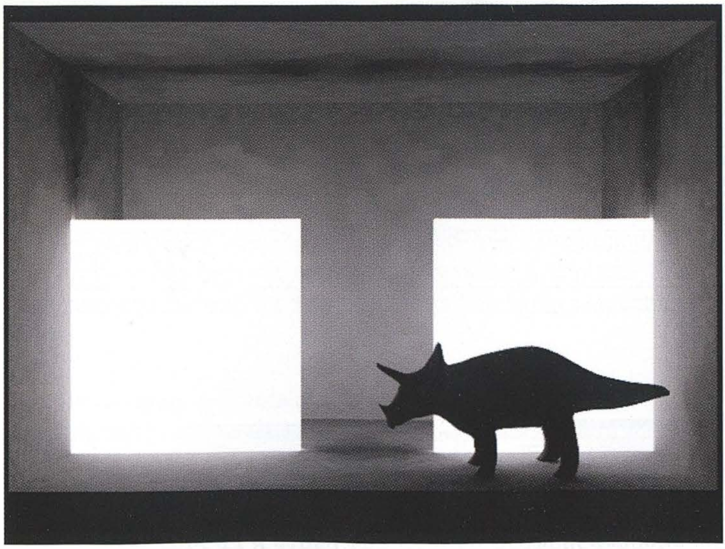


Figure 4: 100% luminous walls with radiosity.

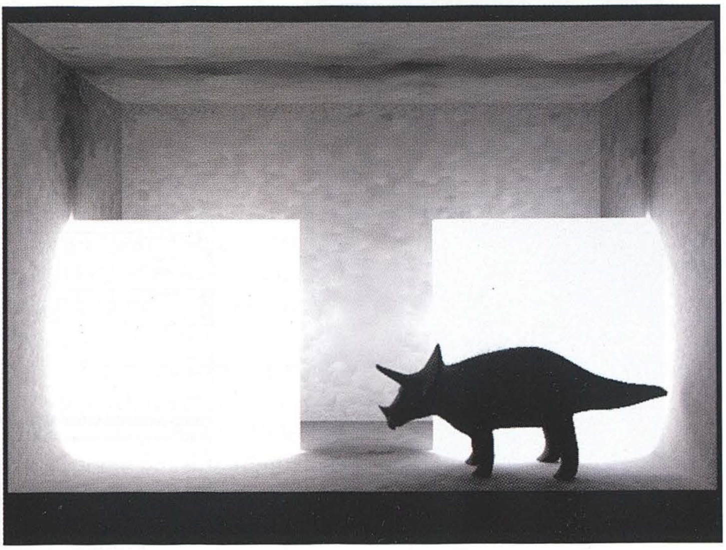


Figure 5: 300% luminous walls with radiosity.

Video Toaster NT Plug-ins and Issues

Up Close and Personal

by Jason Goodman

A little more than one year after its introduction, the much-ballyhooed Video Toaster NT remains largely unchanged by NewTek. The onboard sound I/O capability still lies vestigial. The storyboard editor and switcher are still unavailable. There is no integrated solution for using DV footage, no real time options for compression, and no easy way to create an MPEG file of any kind with the stock tools.

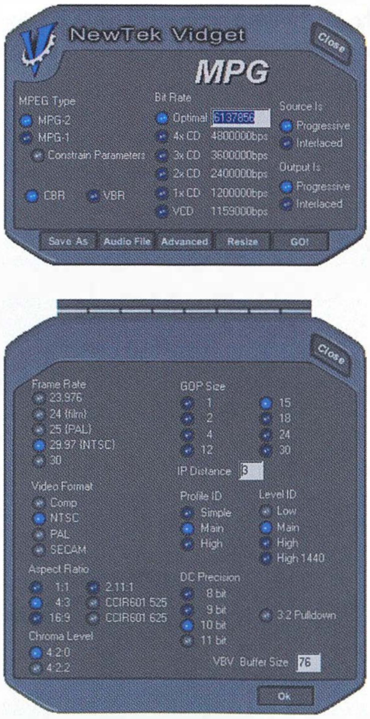
Recently some of these limitations have been addressed, but then again, many have not. On the plus side, as I write this, Vidget has just been released. It offers a wide range of controls for creating many different media types directly from RTV and other file types. However, Vidget is a band-aid for a larger problem, and it still lacks many important capabilities that demanding users need now.

A lot of people will read this and say I am being combative or argumentative. That is true. I have come to expect a lot from NewTek as I do from any company I deal with. So often it seems that silly, seemingly simple limitations cause NewTek products to fall just short of the mark. Addressing these issues should be of paramount importance for NewTek, but these issues do not seem to take precedence.

Many of the limitations I described in my first look at the VTNT are being addressed today not by NewTek or in:sync, but by third party vendors. For the past several months I have been getting a whole lot more out of my Video Toaster, and it is all due to the efforts of third party products.

The linchpin to this newfound functionality is Bob Tasa and his excellent software. Bob is an enterprising individual and software developer who has created two powerful plug-ins that have revolutionized Video Toaster 1.x and in many ways have beat NewTek to punches 2.0 won't even be able to throw. These plug-ins are called **RTV I/O for Premiere** and **RTV I/O for After Effects**. These products are marvelous in their purpose and simplicity. They allow the Video Toaster NT to interface directly with Adobe Premiere 5.x and Adobe After Effects 4.x, giving these apps the ability to read and write Toaster-native RTV files, as shown in Figure 2.

THIS IS HUGE! Why NewTek did not make this capability a priority from the start is a mystery to me. The excuse obviously could not have been the technical challenges of development if one man could do it on his own in the time frame that Bob has. These plug-ins' capabilities expand the appeal of the Toaster enormously. Whether you love Speed



MPEG Type
● MPG-2
○ MPG-1
○ Constrain Parameters
● CBR ○ VBR

Bit Rate
● Optimal 6137856
○ 4x CD 4800000bps
○ 3x CD 3600000bps
○ 2x CD 2400000bps
○ 1x CD 1200000bps
○ VCD 1153000bps

Source Is
● Progressive
○ Interlaced

Output Is
● Progressive
○ Interlaced

Frame Rate
○ 23.976
○ 24 (film)
○ 25 (PAL)
● 29.97 (NTSC)
○ 30

Video Format
○ Comp
● NTSC
○ PAL
○ SECAM

Aspect Ratio
○ 1:1 ○ 2.11:1
● 4:3 ○ CCIR601 525
○ 16:9 ○ CCIR601 625

Chroma Level
● 4:2:0
○ 4:2:2

GOP Size
○ 1 ● 15
○ 2 ○ 18
○ 4 ○ 24
○ 12 ○ 30

IP Distance 3

Profile ID
○ Simple
● Main
○ High

Level ID
○ Low
● Main
○ High
○ High 1440

DC Precision
○ 8 bit
○ 9 bit
● 10 bit
○ 11 bit

○ 3:2 Pulldown

VBV Buffer Size 76

Figure 1: Vidget interface

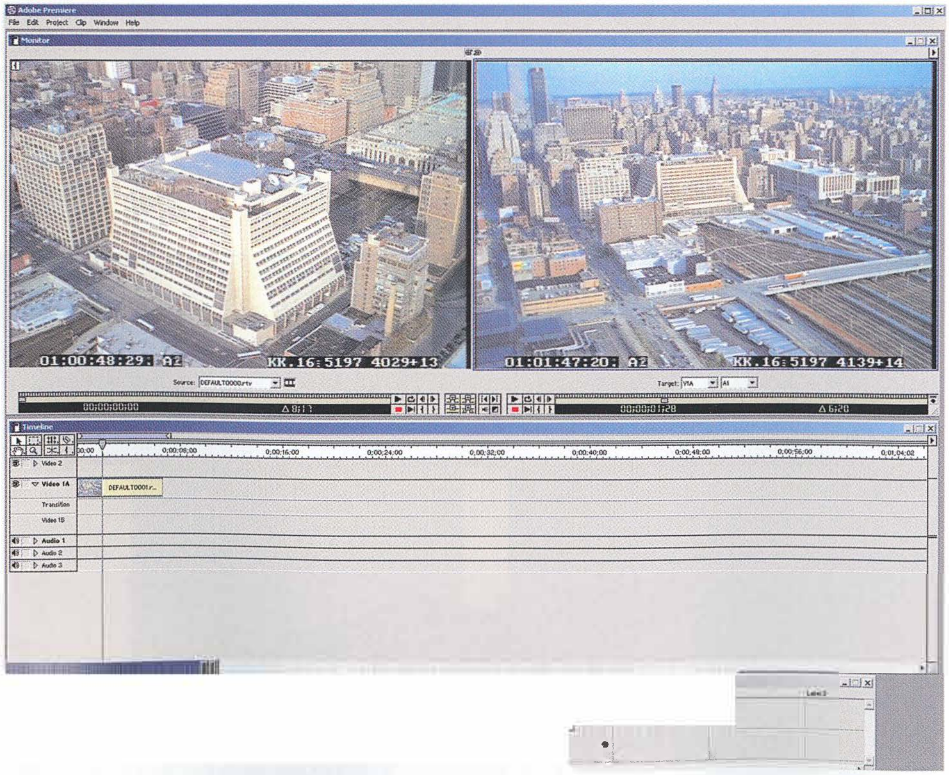
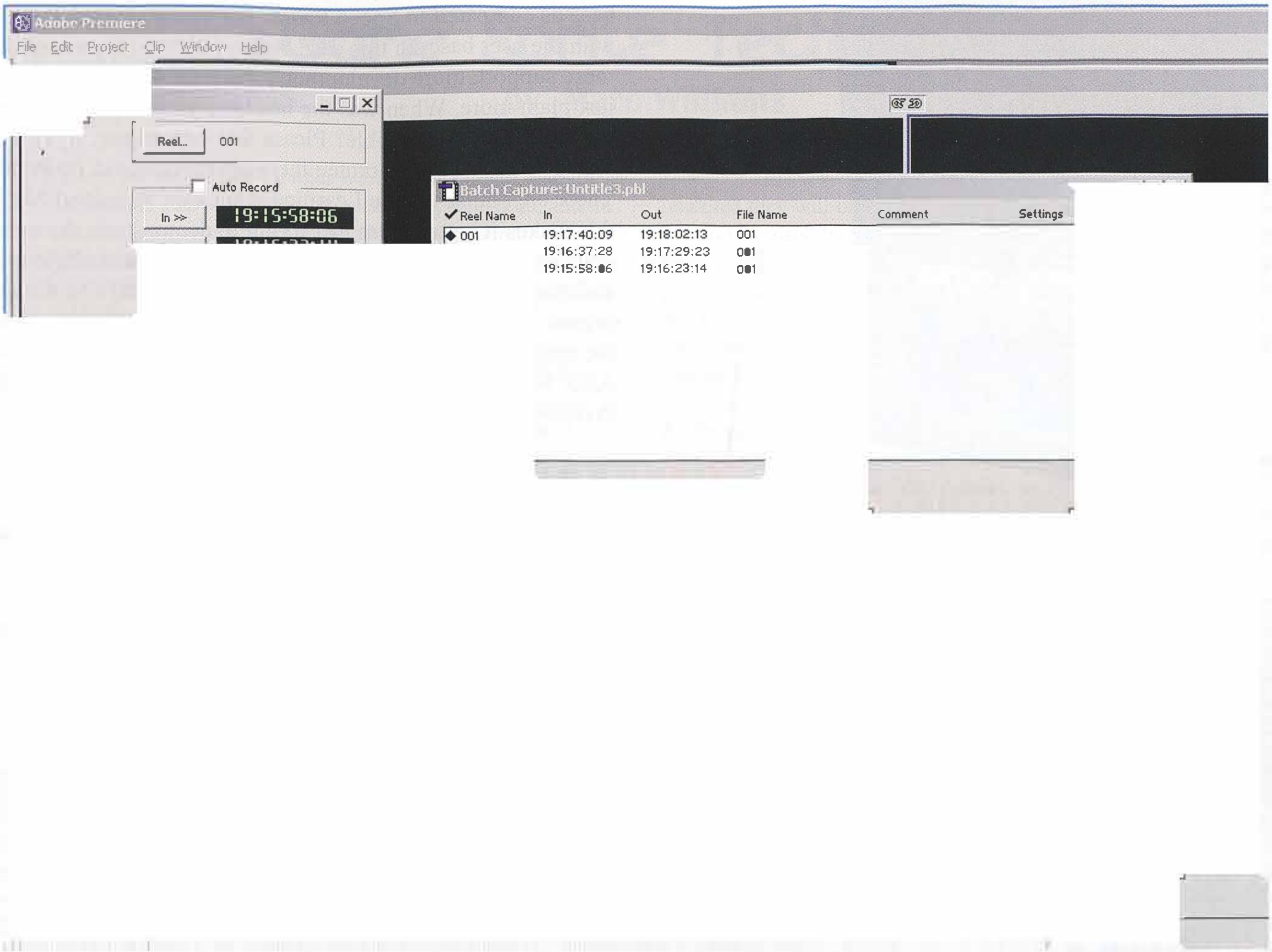


Figure 2: Adobe Premiere interface with Toaster-native RTV clips loaded.



Batch Capture: Untitle3.pbl

✓ Reel Name	In	Out	File Name	Comment	Settings
◆ 001	19:17:40:09	19:18:02:13	001		
	19:16:37:28	19:17:29:23	001		
	19:15:58:06	19:16:23:14	001		

Figure 3: Premiere's batch capture process is superior to Speed Razor's.

Razor and Aura or hate them, no one tool is suitable for every situation. Premiere and After Effects have been refined for years and are staples in most video and multimedia production environments. Adding them to the Toaster mix can only mean good news. While NewTek's new AVI "wrapper" will allow you to use RTV clips in a wide variety of applications, it does not provide realtime playback, or batch capture capabilities in the way that RTV I/O does.

My company, MSD, produces video for the web, CD-ROM and DVD. I have had nothing but problems from the get-go with Speed Razor. I find the interface non-intuitive and clumsy. The 4.5SE product has been buggy, and simply does not do many of the things it claims to. I cannot believe the chutzpah in:sync exhibits by offering a "discounted" price on an upgrade to a product that does not work correctly in the first place. To me, having no choice but Speed Razor is like having no choice at all.

By integrating Premiere into your Toaster production environment, you get all of the benefits of having one of the most widely used, best supported, most mature software NLEs available. Premiere's batch capture capabilities are far superior to Speed Razor in many respects, Figure 3. Batch lists can be saved as their own files and revisited independently from the project. They can be easily manually edited, commented on, saved for later, reused, etc. Captured clip libraries are saved separately too. Premiere is about to get much more powerful as well. 6.0 offers expanded DV capabilities along with a broad array of new features. The latest Speed Razor overhauls seem to be generating a lot of questions on Safe Harbor's Videotoasternt.com message board, especially where QuickTime is concerned.

To utilize Premiere's batch capture functions with RTV I/O, you will need to purchase ProVTR from Pipeline Digital (**www.thepipe.com**). ProVTR consists of a hardware lock (which is also a deck control cable) and a Premiere plug-in that enables you to control a wide array of video tape recorders. This in combination with RTV I/O will run you in the neighborhood of $300 more than a stock Toaster. Add another $600 if you don't already own Premiere.

For many users these prices may be a big downside. The truth of the matter is, even if you do not own Premiere, the advantages it offers Video Toaster users right now make it worth the price of admission. Of course all of this is my opinion, but Premiere just seems to make more sense than Speed Razor. Matters of personal preference are fairly pointless to argue. What you cannot argue is the size of Premiere's user base as compared to Speed Razor, and the benefits that go along with the user base. In this case bigger is better. Bigger means more support, more development, more third party products and just plain more. When was the last time you saw a Speed Razor book in Barnes and Noble? Please don't email me if you have seen one because I guarantee there are more books on Premiere. There are courses at the Learning Annex on Premiere! Not that this makes it better; I am just trying to demonstrate the tremendous accessibility the Adobe products offer. What about the ability to integrate QuickTime, AVI, RTV and DV in the same project? Speed Razor SE does not offer this capability. Perhaps the upgraded versions can, but that again is not a stock Toaster. Also, Speed Razor is brand new to the QuickTime game, while Premiere has been handling it elegantly for years.

NewTek's introduction of the RTV-AVI wrapper is an important one. It will provide many of the benefits that RTV I/O does as far as integrating the Toaster with other apps. The really nice thing about this is that many more VTNT users will get the chance to take advantage of tools like Premiere. One of the best things about Premiere is that many other manufacturers have already gotten their products into the Adobe fold. The best

Continued on Page 30

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Game Sprite Techniques

by Marc Williams

Back in the early 1980's games were much simpler than they are today. Artists didn't have to worry about the polygon count, and, in my opinion, many games were much more addictive and simply fun to play. Many of us will remember wasting many hours (and lots of money) glued to Donkey Kong in the arcade, and by today's graphic standards that is an extremely simple game.

Many hardcore gamers who get a PC will often dabble in a dash of Games Programming. I don't know how many simple games I've played on the net that were let down by really poor graphics. I know you don't need an art degree to design a game, but if I'm playing a tank on the battlefield I want it to at least resemble a tank, not a single-color square box!

The trouble is the graphics or 'sprites' (you remember them!) of these games were drawn or programmed by hand for each frame; consequently, some sprites look really awful. In this case study, I going to show you how to streamline this process and let LightWave do all the work.

Starting Up

First, before you power-up LightWave, sit down with some pencils and paper. As with all good projects, we need a plan. For the sprite(s), a good place to start would be the game's Design Document. This is an industry buzzword for a game plan; it will contain all the game information, including how your characters will move and interact with the game environment.

For my example I'm going to be using a simple man for the game character. I look in the design document for our character and I see that his main movements are walking left and right. Because this is a platform game, he/she will have other movements, but let's concentrate on the main ones for this demonstration. From this short bit of information I have already reached several conclusions. The character will be viewed from the side, and the left and right walk will be the same, just in opposite directions. I'll get to why this is important later on.

I've also noted that the game will be in 256 colors at 800x600 resolution. This will have implications for sprite size and definition, so we will just note it down for now. Now we can start to design our sprite.

Designing The Sprite

Figure 1 shows a simple sketch of the walking motion. This is the walk motion only, so when the player moves right these are the frames that will be played. These little frame sketches will help you visualize your idea more precisely, making the animation process a whole lot easier. You will be able to actually see what you have to model; this can be a real time saver.

You will also notice when ideas just don't work. On paper this is much quicker to alter than it is in a 60-frame animation. So plan, plan, then plan some more!

One very important note is that when the frames are finally rendered they will only be 64x128 in size for our character. With this in mind we need to remember that if you add small details like bump textures and hair motion, the player's eye may not pick it up at all. So generally a good rule of thumb is to make your movements obvious and to keep the sprite colors plain and simple. For my game the maximum color limit is 256, so I need to take this into account when designing the colors.

Modeling Your Sprites

If you're designing a player tank, don't go all out and build the underside and all the little details. As the player never sees this it doesn't matter. Figure 2 shows a sprite model from my latest game. Notice how it's actually a tank, however because the player only ever sees it from above I can be quite lax when it comes to the details.

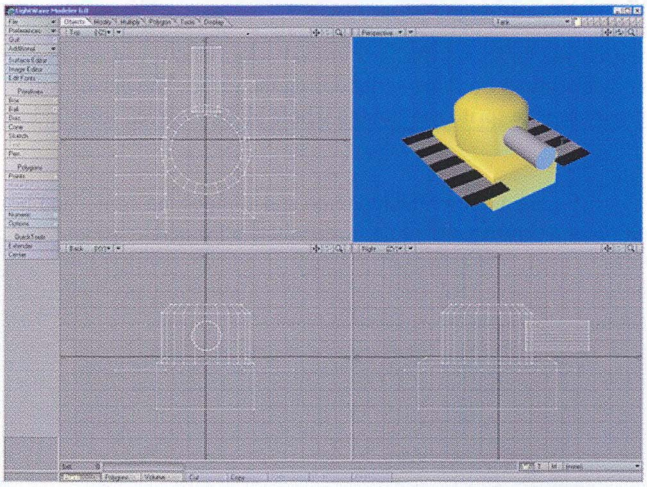


Figure 2: Sprite model from Tankwarz game.

Notice how simple the design and colors are; Figure 3 shows this sprite when rendered for the game.

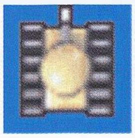
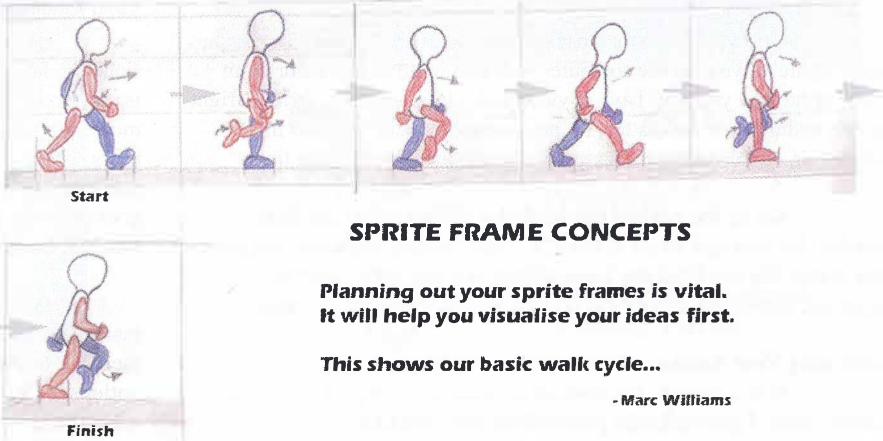


Figure 3: Tank sprite rendered for the game.



SPRITE FRAME CONCEPTS

Planning out your sprite frames is vital. It will help you visualise your ideas first.

This shows our basic walk cycle...

- Marc Williams

Figure 1: A simple sketch of the walking motion.

When modeling for sprites you can keep it simple. Checking with your design document and frame sketches will aid you immensely. So remember, model only what the player can see! The simpler your object is, the better it will look at low resolutions.

Setting Up Your Scene

When you've built your sprite and decided on the look you can start to set up a generic scene. A generic scene is one scene file that contains simple light and background color information.

Once you have decided on the light direction for your game you can set it in the generic scene. Just load a demo sprite and get the lighting how you want it. When this is correct we need a masking/transparent screen color. Go to Settings|Effects|Background and set the background color to something like a sharp blue (000,128,255) or green. This is your masking color.

Masking and transparency are extremely important to sprite animation and design. When we create a sprite frame we actually have a block of color. However in the game world we need our sprite to show just the object inside this block of color (our man). Color masking enables us to pick a color and the computer will remove it during the game. So if we have a green background it will remove the green background from the sprite during the game. The player will then only see the sprite and not the whole block of green surrounding it.

Figure 4 shows the rendered and composited sprite, and how the sprite will look in the game. Notice how all the blue color (000,128,255) has been removed by the game. An identical technique is used in Hollywood films and is referred to as 'Green screening'. Both incorporate the same principles.

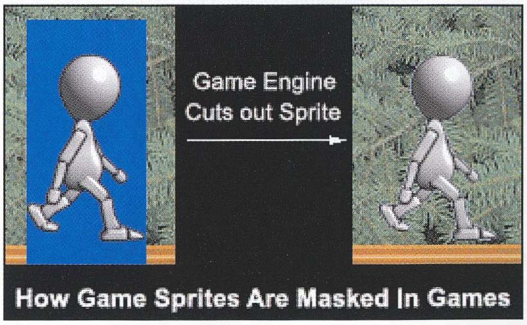


Figure 4: Sprite masking.

Be aware. Choose a background color that doesn't appear in your sprite! If you do the computer will also remove that color from your sprite and you will have obvious holes in your game sprite. Bright green and blue are colors that do not normally occur together in a character, so I can generally use whichever one is best at the time.

Set up the camera size so that it can represent the final render. My example is set at 64x128. Then remove the sprite and save the scene. We can load any game object into this scene and the lighting, camera information and masking color will be identical.

Texturing Your Sprites

If you have to use textures to achieve your goal, at least use simple ones. I generally use plain colors with specular highlights. However, I understand that sometimes reflections and bumps can make the sprite look better. My advice with texturing your sprites would be to test them again and again. Your sprite may look great in one frame, but once animated, the textures may make it look all blurry. So keep it simple.

Animating Your Sprites

This will differ from each sprite in your game but, again, keep it simple. Complex movements may look nice at 640x480, but at sprite level they will look a complete mess.

For my example I set it to 60 frames for the complete two-step walk cycle. It is important to make your starting and end frames very similar so your animation will loop seamlessly. This is required for good game sprite animation. Other than these points, you can use any animation technique to achieve your aim. If you want to setup an IK skeleton for your character then do it. I generally keyframe sprite animation, but that's a personal choice.

Another shortcut would be using the same animation scene for a different angle. If you have a walking animation, odds are that you will also have to make your character go in the other direction. If you just flip the final frames around then you will have the light source on the opposite side. This will look extremely fake, so try to avoid it. All you have to do is shoot the same animation from the other side.

Move the camera position and rotation to the opposite side of your sprite, then also swap your light position and rotation to opposite values. You will then have the animation the opposite way around with correct lighting and positioning. This is a huge time-saver and will look more consistent with the other frames.

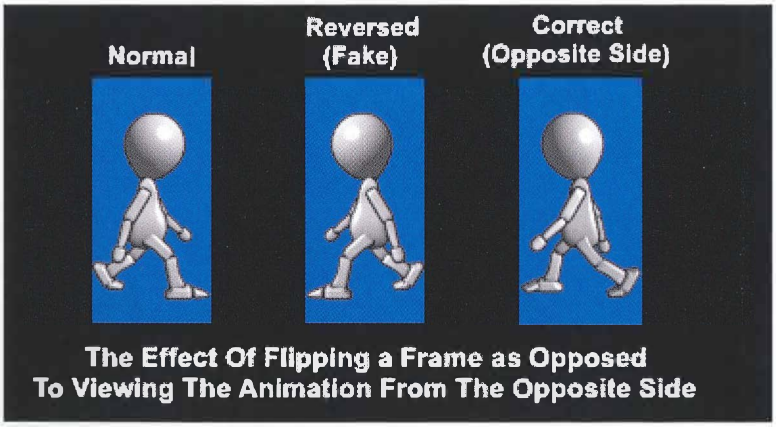

Normal
Reversed (Fake)
Correct (Opposite Side)
The Effect Of Flipping a Frame as Opposed To Viewing The Animation From The Opposite Side

Figure 5: Sprite flipping.

Final Render And Output

When your animation is completed you can begin to add final touches. One that I add is a faint black line around the sprite. This is a personal preference but can sometimes make sprites stand out more. To achieve this, select each object in your sprite in turn and press 'p' to go to object properties. Enter the Edges panel and select the Silhouette option and leave it at the default of 1.0 pixel. This will give us a nice black line around our sprite. You can add similar touches, but try to make it look unique to your game.

Make sure your camera is set to the correct resolution and make sure you have anti-aliasing on a low setting. In my walk example there are 60 frames; this is overkill for a tiny sprite. So I set the render options to: Start Frame 0, End Frame 60, Frame Step 5.

This will give us 13 frames for our walking sprite animation. Obviously you can change these settings to your own needs. Then set to render single RGB images to a format you are happy with. I generally output to *.bmp. Then render out your frames with Full Uncompressed Frames as the compression choice.

How Are Sprites Finally Output

As our aim is to create sprites we can use in a game, you need to understand how they are saved in a picture file. Normally it is a lot easier for programmers if artists place their frames in order from left to right, then top to bottom. There generally is a one-pixel space around each frame, so you eventually have a grid of frames of your chosen sprite.

Remember that if your sprites are a certain size your grid or border will be 1 pixel bigger at the sides. In my example our frames are 64x128 so my grid squares need to be 66x130. Use your paint package to load each frame in order and cut out the whole frame. Then place them on a single picture file with the grid already put down. Figure 6 shows this technique and the grid notes.

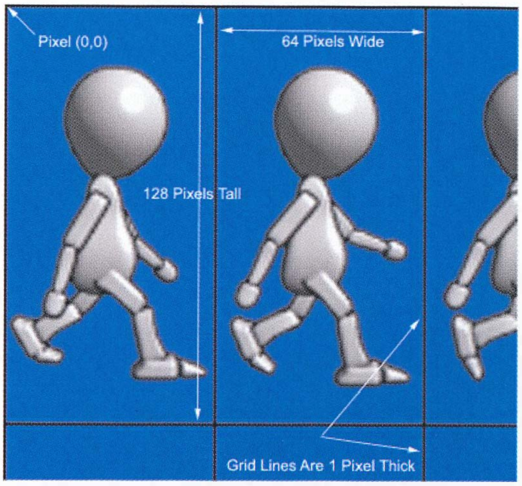


Figure 6: Grid picture file with notes.

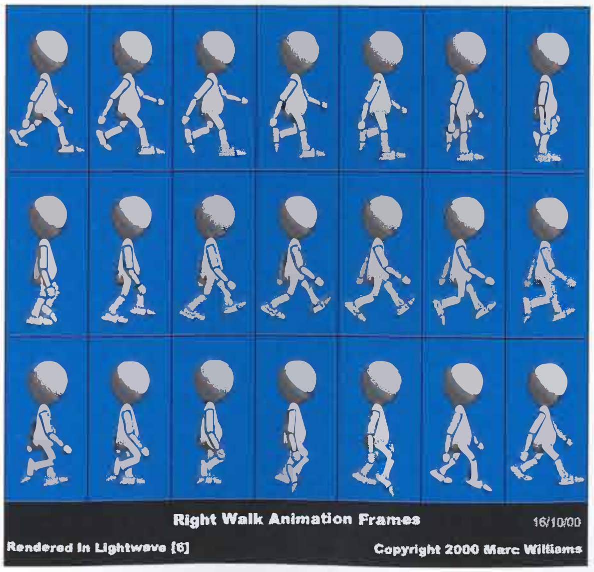

Right Walk Animation Frames
16/10/00
Rendered In Lightwave [6]
Copyright 2000 Marc Williams

Figure 7: Final rendered sprite frames.

You can then convert your file into 256 colors (if your game needs this), then save it as a final image file to be loaded into your game. Figure 7 shows a final rendered sprite frame of our walk animation.

Final Round 'em Up

Sprites are generally dead in today's 3D games. However if you create games yourself or you create graphics that utilize the sprite principles (multimedia CD's, icons, etc.), then LightWave has many tools to help you achieve your goal. I hope you've enjoyed this look into sprite design and animation, and remember above all else, HAVE FUN. Happy animating folks!

Marc Williams is a freelance digital artist and animator who has a passion for all things 3D. You can email him at marc@spydaman.com. Check out how sprites were used in his latest game Tankwarz at his website www.spydaman.com.

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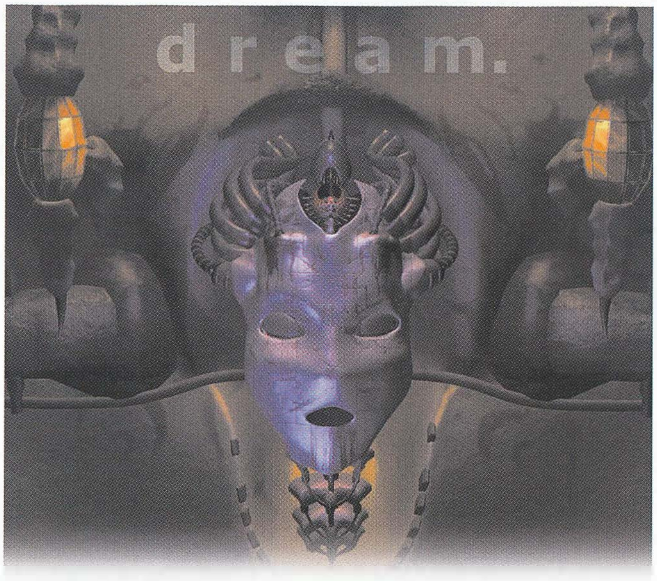

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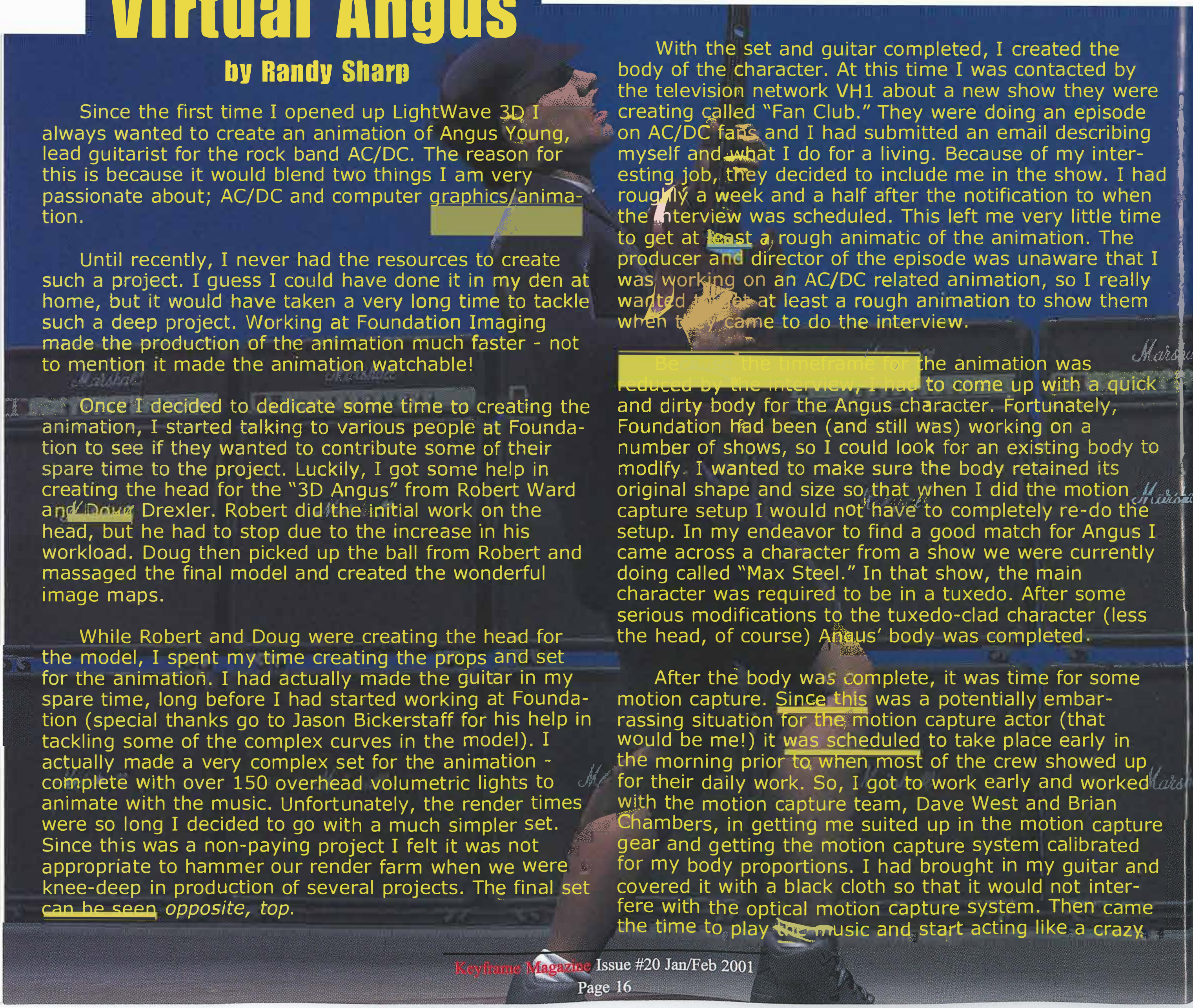


Since the first time I opened up LightWave 3D I always wanted to create an animation of Angus Young, lead guitarist for the rock band AC/DC. The reason for this is because it would blend two things I am very passionate about; AC/DC and computer graphics/animation.

Until recently, I never had the resources to create such a project. I guess I could have done it in my den at home, but it would have taken a very long time to tackle such a deep project. Working at Foundation Imaging made the production of the animation much faster - not to mention it made the animation watchable!

Once I decided to dedicate some time to creating the animation, I started talking to various people at Foundation to see if they wanted to contribute some of their spare time to the project. Luckily, I got some help in creating the head for the "3D Angus" from Robert Ward and Doug Drexler. Robert did the initial work on the head, but he had to stop due to the increase in his workload. Doug then picked up the ball from Robert and massaged the final model and created the wonderful image maps.

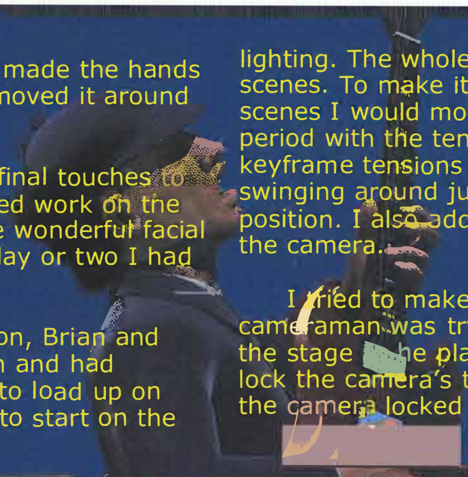
While Robert and Doug were creating the head for the model, I spent my time creating the props and set for the animation. I had actually made the guitar in my spare time, long before I had started working at Foundation (special thanks go to Jason Bickerstaff for his help in tackling some of the complex curves in the model). I actually made a very complex set for the animation - complete with over 150 overhead volumetric lights to animate with the music. Unfortunately, the render times were so long I decided to go with a much simpler set. Since this was a non-paying project I felt it was not appropriate to hammer our render farm when we were knee-deep in production of several projects. The final set can be seen *opposite, top*.

With the set and guitar completed, I created the body of the character. At this time I was contacted by the television network VH1 about a new show they were creating called "Fan Club." They were doing an episode on AC/DC fans and I had submitted an email describing myself and what I do for a living. Because of my interesting job, they decided to include me in the show. I had roughly a week and a half after the notification to when the interview was scheduled. This left me very little time to get at least a rough animatic of the animation. The producer and director of the episode was unaware that I was working on an AC/DC related animation, so I really wanted to get at least a rough animation to show them when they came to do the interview.

Because the timeframe for the animation was reduced by the interview, I had to come up with a quick and dirty body for the Angus character. Fortunately, Foundation had been (and still was) working on a number of shows, so I could look for an existing body to modify. I wanted to make sure the body retained its original shape and size so that when I did the motion capture setup I would not have to completely re-do the setup. In my endeavor to find a good match for Angus I came across a character from a show we were currently doing called "Max Steel." In that show, the main character was required to be in a tuxedo. After some serious modifications to the tuxedo-clad character (less the head, of course) Angus' body was completed.

After the body was complete, it was time for some motion capture. Since this was a potentially embarrassing situation for the motion capture actor (that would be me!) it was scheduled to take place early in the morning prior to when most of the crew showed up for their daily work. So, I got to work early and worked with the motion capture team, Dave West and Brian Chambers, in getting me suited up in the motion capture gear and getting the motion capture system calibrated for my body proportions. I had brought in my guitar and covered it with a black cloth so that it would not interfere with the optical motion capture system. Then came the time to play the music and start acting like a crazy man. I finished capturing just as most of the crew had shown up for work - there were a few hecklers in the crowd.

Once the capturing was completed, it was up to Brian and Dave to filter the data. Once the initial filtering was done, it was apparent that it was going to be very difficult to track the hands to the guitar; both on the neck of the guitar and at the body where the picking hand plays. It was decided to do another motion capture session with a stand-in guitar with motion capture markers in place so that the movement of the guitar, in relation to the character, could handled better. So, the following day I put the motion capture suit back on and did the "Angus routine" once again. This time, the hands and guitar work together well. To make life even easier, Brian was able to lock the hands to the guitar neck and body. This made the hands follow the movement of the guitar as I moved it around during the motion capture session.



With Brian and Dave putting on the final touches to the motion capture data filtering, I started work on the facial expressions. Doug had made some wonderful facial targets to work with and in less than a day or two I had completed the facial animation.

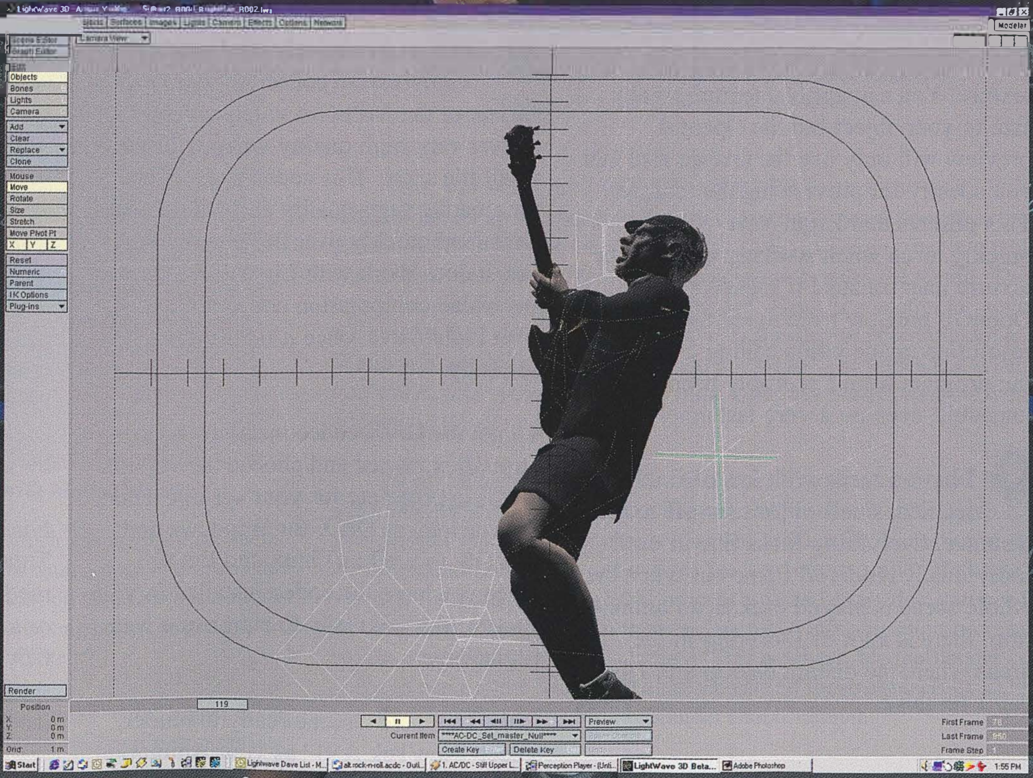
When I completed the facial animation, Brian and Dave had filtered the captured animation and had written out the LightWave scene for me to load up on my system. With that done, it was time to start on the next step.

The next part in development was to animate the hands. To make my life easier I went up to one of our capture bays and captured video of me playing the guitar riff that is played during the song. Since I am not very good at playing the guitar I was only able to approximate where the hand should be, and time my picking hand to what was actually played. This turned out to be very useful. I was able to play back the capture session on the PVR at my desk while I moved the hands of the character to the exact timing of the music. It turned out to a very valuable, time saving process.

With the facial, hands, guitar, and filtered motion capture animation complete it was time to start on the camera movements and final lighting. The whole animation is done in two LightWave scenes. To make it seem like there were more than two scenes I would move the camera over a one-frame period with the tension set to linear. Setting the keyframe tensions to linear prevented the camera from swinging around just prior to it "popping" into its new position. I also added coarse and subtle movements to the camera.

I tried to make the animation look like the cameraman was trying to follow the character around the stage as he played his song. Many times people will lock the camera's target to part of a character. Having the camera locked like that tends to make animations

Continued on page 25



LightWave 3D
Items
Surfaces
Images
Lights
Camera
Effects
Options
Network
Modeler
Camera View
Objects
Bones
Lights
Camera
Add
Clear
Replace
Clone
Mouse
Move
Rotate
Size
Stretch
Move Pivot Pt
X
Y
Z
Reset
Numeric
Parent
IK Options
Plug-ins
Render
Position
119
Current Item
Create Key
Delete Key
Preview
First Frame
Last Frame
Frame Step
Start
Adobe Photoshop
1:55 PM

Continued from page 7

versions of LightWave!

Q How can I render an object so that it appears to be totally flat, like an overhead view of a building layout?

A What you want to generate is called an Orthographic View of your object. There are a number of commercial plug-ins available that perform this function, as well as many other things, but it is not necessary to buy a plug-in just to do this one thing. All you need to do to duplicate this effect is to crank up the Zoom Angle on your camera so that is extremely high, a setting of 50 to 75 should be adequate. Then you just pull the camera back away from the object until you can see the object within the camera's safe area. Now when you render this image, most of the camera's perspective distortion effect will be removed and the object will appear to have more of a "flat" appearance.

Q I noticed that the UV-Mapping feature has Texture Size limits that are much smaller than the image I want to map onto my object. How can I apply a UV texture that is larger than 512x512 pixels?

A The UV Texture Size value only applies to the OpenGL preview that you see while working on your texture. You can apply a texture of any size to your object but the OpenGL preview will only use the texture size that you specify for previewing the texture. This ensures that LightWave will run quickly, even when working with a large texture map because if LightWave's OpenGL preview tried to redraw a full resolution image while editing a UV map, the program would probably become unusable, even on a very fast machine.

Q I have a scene with lots of finely detailed, small objects far off in the distance. Everything looks fine in each individually rendered frame but when the whole scene is played back as an animation, there is a lot of flickering in the areas where the distant objects are. How can I fix this?

A This is a perfect example of where Depth of Field should be used. The human eye and all cameras can only see so far before things get blurry, but in the 3-D world, the computer will try to render every tiny detail in the scene so you end up with tiny pixels of detail that flicker in and out of existence. The way to eliminate these flickering artifacts and make your animation look much more realistic is to apply a Depth of Field value that will blur out the very distant objects. Keep in mind that this effect is very render-intensive because it requires you to use an anti-aliasing setting of at least Medium.

Q I've heard some great things about a new animation compression codec called DivX. Does LightWave support this codec and how can I use it with LightWave?

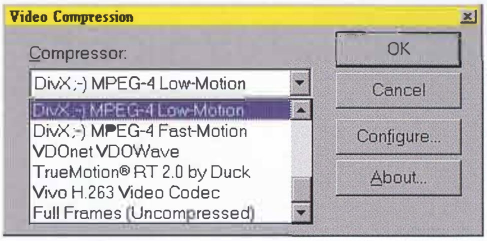

Video Compression
Compressor:
DivX ;-) MPEG-4 Low-Motion
DivX ;-) MPEG-4 Low-Motion
DivX ;-) MPEG-4 Fast-Motion
VDOnet VDOWave
TrueMotion® RT 2.0 by Duck
Vivo H.263 Video Codec
Full Frames (Uncompressed)
OK
Cancel
Configure...
About...

Figure 3: *Once installed, the "DivX ;-)" codec will give you the ability to create extremely small, high quality animations with LightWave.*

A DivX is a relatively new video compression codec that uses a variant of the MPEG-4 video codec to deliver very high quality video with very small file sizes. This codec is excellent for creating high-quality animations that download quickly over the Internet and, yes, it does work with LightWave. In fact, any video compression codec will work with LightWave, once it is installed correctly.

To get the DivX codec installer, go to http://divx.ctw.cc and choose the version that is appropriate for your system. There are versions of DivX for Windows and MacOS, as well as Linux and BeOS. Once you have the codec installed in your system, you are ready to start using it in LightWave.

Once you have a scene ready to render, select "NewTek AVI" as your Animation Type in the Render panel. When you actually tell LightWave to begin rendering, you will be presented with a new dialog box that gives you the ability to select the compression codec that you want to use. This codec dialog box will allow you to select any of the codecs that are installed in your system, so if you have installed the DivX codec correctly, it will be available from this menu.

A few other notes about the DivX codec: For one thing, it is officially known as "DivX ;-)" so don't forget the "smiley" when you tell people you compressed your animation with the DivX codec. The importance of the smiley? Well, I'm not sure but it's probably there to prevent people from confusing "DivX ;-)" with the hugely unpopular pay-per-view DivX video-disc format that died a well-deserved death in the later 1990s. While no one can predict the future of the Internet, I believe that the "DivX ;-)" codec is a key part of streaming video over the Internet in the years to come. All you have to do is compress your animations with "DivX ;-)" and one of the older codecs, like Cinepak or Indeo, and you'll see how much better the video quality is, with much smaller file sizes!

See you all again in the next issue!

For those of you who enjoy reading this column and find a great benefit from the knowledge exchanged on the LightWave Mailing List, I encourage you to check out a new product my company has just released: The LightWave Mailing List Search Engine CD contains nearly 87,000 messages compiled together in a format that is easy to search for any topic that has been discussed in the past 3 years! It is available now for only $19.95 and is a valuable information resource for all LightWave users. You can find out more by visiting www.tv3d.com

For more info about David Warner or TutorVision 3-D CD, his series of multi-media tutorial CD-ROMs for LightWave, or to receive a FREE TutorVision Sampler CD, please visit http://www.tv3d.com or send some e-mail directly to Dave at dave@tv3d.com

The MotionBlender Effect

by Ron Wolfe

Project:messiah has turned a lot of heads in the short time that it has been around. It contains a wide variety of effects and functions, an intelligently laid out interface, and is blazingly fast. The programming team behind it has continued to add innovative features with each release. One of these features is an effect called MotionBlender. This article will focus on the value of MotionBlender in your animation toolset.

To quote from the project:messiah team: "MotionBlender allows you to tie pre-posed bone positions to sliders, so when you move the sliders the bones go into that pose. You can have as many sliders and as many poses as you want. In addition, poses can be created or modified on the fly. You can even create poses by adjusting existing sliders, and then tie that new pose to its own slider. You can think of it like 'Morph Gizmo for bones' if you prefer, although that doesn't even begin to hint at the power it has."

While this tutorial shows MotionBlender being used with bones, MotionBlender is not actually restricted to bones; it will work with any item. MotionBlender is handy for facial animation, monster parts, and especially hands. You can build a library of hand poses, and instead of keyframing a minimum of 15 bones in your animation when you want to pose the hand, just insert a MotionBlender pose by moving one channel slider.

Let me further explain MotionBlender in the context of facial animation, starting with this statement that will shock every non-messiah animator: in messiah, I animate the face with bones, not morphs. (See Figure 1.) This is possible because not only do messiah's bones work the way they should, but with messiah's speed, the addition of even a hundred or so bones for the face does not slow it down.

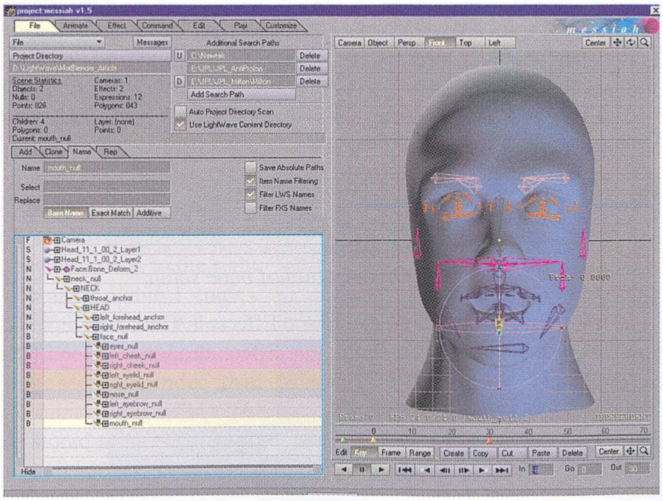


Figure 1:Facial animation setup with MotionBlender.

With the bones properly set up, it's much easier to create facial poses in messiah than it is in Modeler. If you want a pose that opens the jaw, would you rather: Find the precise points and then move and rotate them in Modeler, constantly selecting or deselecting points as you go; or, Select the Jaw bone in messiah and simply rotate it?

With messiah bones you sculpt your poses with higher-level control. Bones can move and rotate the points and apply appropriate falloff. You are relieved from the duty of fine-tuning the placement of each individual point in the face.

For example, suppose your assignment is to build some face poses for a character's emotional expressions and speech phonemes. You decide to start with a smile pose. So we can efficiently apply MotionBlender later, we are going to build the pose in a negative key range. This gets our poses out of the way of our animation but stores them in a convenient location for building and adjusting. To build the smile, you want the mouth to be closed, so you select the JAW bone and rotate it. Targeting expressions keep the lip corners from pinching unrealistically. (See Figures 2 and 3.)

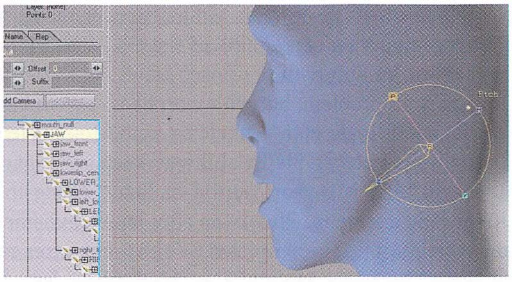


Figure 2: *JAW bone in open position.*

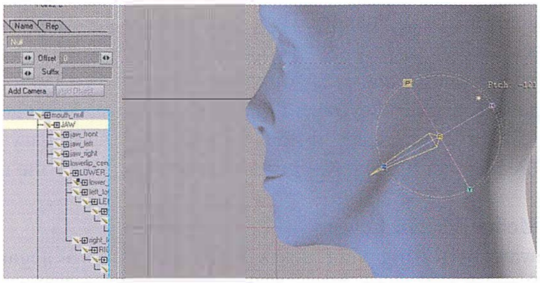


Figure 3: *JAW bone in closed position.*

Next, you select the LEFT_LIP_CORNER control and rotate it to raise the corner up into position. You perform the same adjustment to the RIGHT_LIP_CORNER control. Now the mouth is smiling, but in a real smile there are more parts of the face involved besides the mouth. The entire face has to look like it's smiling, too. There is a control to move the cheeks. You use this to swell the cheeks forward and outwards some. While you are studying your own face in a mirror you notice that when you smile, your eyebrows rise up a little. Using the correct controls, you add this to the smile pose.

Now you have the smile pose at frame -10 and all told, you have used 13 separate controls to make the pose. With several of the controls, you adjusted more than one channel, so you could easily be dealing with 20-25 channels of motion just to pose the face into its smile. Of course, you don't want to go through that process each and every time you need a smile inserted into your animation, because your animation process would not be intuitive or productive. This is where MotionBlender is going to come to the rescue. You can animate all those channels by only adjusting one channel; a MotionBlender slider channel.

With MotionBlender you can also fine-tune that smile pose by applying it with a percentage. Do you want to make a grin and apply the smile at 50% strength? MotionBlender does it. You can even blend other poses with it, using an additive or averaged blend. (See Figure 4.)

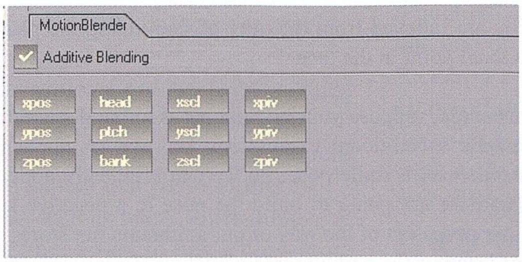

MotionBlender
☑ Additive Blending
xpos
ypos
zpos
head
ptch
bank
xscl
yscl
zscl
xpiv
ypiv
zpiv

Figure 4:MotionBlender additive blending.

Why don't I just use morphing? Here are a few of my many reasons. Only one object is needed. MotionBlender moves points in a linear fashion or in curving arcs. Think of fingers. With MotionBlender, you can have an entire library of pre-posed hands. With MotionBlender, bending fingers is no problem, but with morphs you would need several in-betweens for each finger curl. A skeleton with MotionBlender can be used on multiple characters with the ability to keep poses and animation intact. All it will take is a short period in Setup Mode to adjust the skeleton to the new geometry. Plus, even after another character is using a setup, any animation that is completed on either character can be transferred and shared by using MotionClips. MotionBlender poses can be built on-the-fly. MotionBlender poses can be built entirely in messiah, by the character animator. New MotionBlender poses can be tested immediately in the animation. They can even be created or modified while the animation is playing! MotionBlender can be used on the entire character to make full body pose libraries. The bones in MotionBlender poses can be manually keyframed on top of the pose. This can be used to add anticipation, snap, follow-through and secondary actions. MotionBlender can blend poses just like morphing, hence the name.

A Few MotionBlender Caveats

Beware of testing your poses while you're at a negative key. MotionBlender will work there, but depending if you're upstream or downstream of your stored poses you may get double the effect you're looking for because of its additive feature. So, always test your poses at frame 0 or above. You'll sleep better.

Remember that the default mode (and the one I think you'll find most useful) is additive.

If you like, you can tell MotionBlender to affect only certain channels. I recently used messiah to animate a 3D character for a game. To get the game engine to skin the model properly, I exploded the model on frame 0 and put it back together again on frame 1. Because I had translated parts of the model myself, my MotionBlender poses compounded the effect because they were also working on the x, y and z translation channels. What I did was turn the translation channels off. (See Figure 5) Just remember that this feature can be very useful for special situations, but normally you can leave it alone.

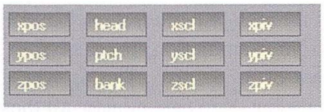

xpos
ypos
zpos
head
ptch
bank
xscl
yscl
zscl
xpiv
ypiv
zpiv

Figure 5: Transition channels.

For the following tutorials, I'm going to assume that you have some basic knowledge of messiah and can get around the interface. If not, you should complete the tutorials that come with the software before attempting these.

Facial Setup and Motion Layering

This tutorial will show you how simple it is to setup MotionBlender and apply it to a facial skeleton. The facial skeleton that is included has some complexities that I urge you to study. In particular, take note of the targeting expressions and how they are used in closing the lips and the eyelids. Also notice how the bones have been setup at natural pivot points to approximate the curving motion that real skin makes when sliding over the skull.

Load face_setup.fxs into messiah for 6.x. Look at the organization of the bone setup. (See Figure 6.) The bones are assembled into groups that correspond with the different areas of the face. Users who are familiar with morphing may recognize that these groups are similar to those you use. This is a planned bone structure. The purpose of this grouping for MotionBlender is that the parent of each group can be used to attach the effect. In my example, it is always a null bone. MotionBlender operates on hierarchies and the null bone specifies the start of each hierarchy. Using this method, we can control separate areas of the face and blend the motion of these areas to achieve many different poses. Utilizing this method leads to a little more setup time, but time used in setup almost always pays dividends during the animation phase.

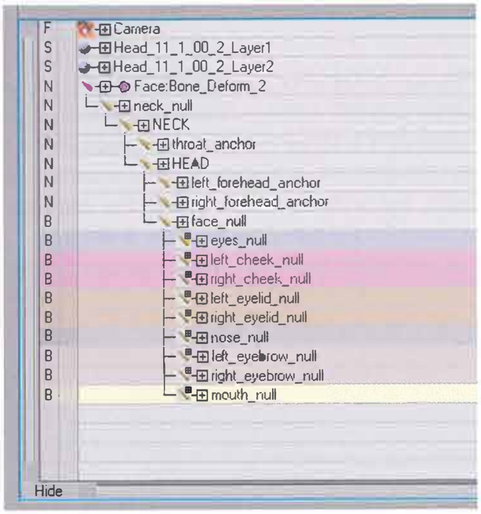

F Camera
S Head_11_1_00_2_Layer1
S Head_11_1_00_2_Layer2
N Face:Bone_Deform_2
N neck_null
N NECK
N throat_anchor
N HEAD
N left_forehead_anchor
N right_forehead_anchor
B face_null
B eyes_null
B left_cheek_null
B right_cheek_null
B left_eyelid_null
B right_eyelid_null
B nose_null
B left_eyebrow_null
B right_eyebrow_null
B mouth_null
Hide

Figure 6: Organization of bone setup.

Select the face_null bone. Go to the Effects TAB. Under Effects > Setup, select MotionBlender from the Effect dropdown menu. (See Figure 7.)

project:messiah v1.5

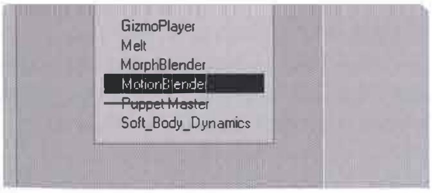

GizmoPlayer
Melt
MorphBlender
MotionBlender
Puppet Master
Soft_Body_Dynamics

Figure 7: Select MotionBlender from Effects|Setup menu.

Make sure that face_null is still selected then left-click the Add Effect button. Return to the Animate TAB.

Value:MotionBlender will be selected. Drag it up and reposition it just below face_null for now.

You will see it is in Setup Mode in the sub-tab at the lower left corner of the screen. There is only one button available: Create Value Slider. (See Figure 8.) Click it now. A slider called ValueControl will be created and added in the Item List. Now it is selected and you should be in its Setup Mode.

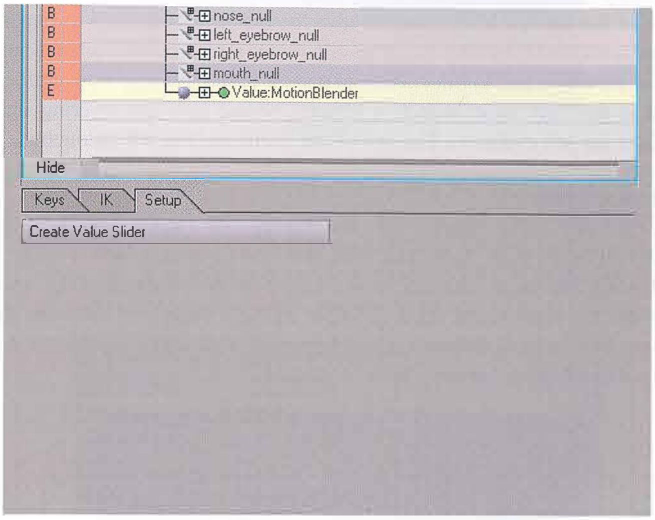
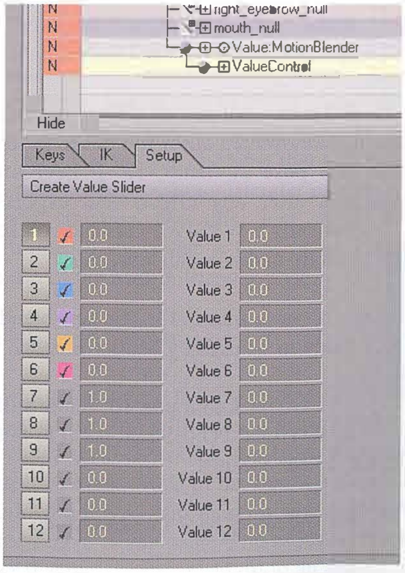

B
B
B
B
E
nose_null
left_eyebrow_null
right_eyebrow_null
mouth_null
Value:MotionBlender
Hide
Keys
IK
Setup
Create Value Slider

Figure 8: *Click Create Value Slider button.*

The Setup panel has 4 columns. (See Figure 9.) The first column on the left side contains the channel numbers (1 - 12). The next column to the right contains little boxes. If you right-click these boxes, its corresponding channel will be toggled On or Off. The next column contains the starting value for each channel. Excepting channels 7, 8, and 9, this setting will be 0.0. The last column on the right has a name to its left and a requester for you to enter values. In that requester you are going to tell MotionBlender which keyframe you want the channel to manage.

Turn off channels 4, 5, and 6 by right-clicking on each corresponding box. In the requester box to the right of the name Value 1 enter -10. Enter -11 for Value 2, and -12 for Value 3. This is telling MotionBlender that for channel 1 it will look at pose stored at frame -10 for face_null and all its children. In this case, that is every bone in the face.


N
N
N
N
right_eyebrow_null
mouth_null
Value:MotionBlender
ValueControl
Hide
Keys
IK
Setup
Create Value Slider

1	✓	0.0	Value 1	0.0
2	✓	0.0	Value 2	0.0
3	✓	0.0	Value 3	0.0
4	✓	0.0	Value 4	0.0
5	✓	0.0	Value 5	0.0
6	✓	0.0	Value 6	0.0
7	✓	1.0	Value 7	0.0
8	✓	1.0	Value 8	0.0
9	✓	1.0	Value 9	0.0
10	✓	0.0	Value 10	0.0
11	✓	0.0	Value 11	0.0
12	✓	0.0	Value 12	0.0

Figure 9: *Setup panel.*

Select the Keys sub-tab. Now we are in Keys Mode for ValueControl and we can replace the generic names of Value_1 with a descriptive name. Note the slider in the animation window as you edit the names. Rename Value_1 to Smile, Value_2 to Angry, and Value_3 to Sad. The names have also updated on the slider. (See Figure 10.)

You may notice that the MotionBlender effect has already been applied to all the facial bone subgroups. They were set up in the exactly the same manner as I just described for the face_null. The reason I have set them up will be made apparent later in this tutorial.

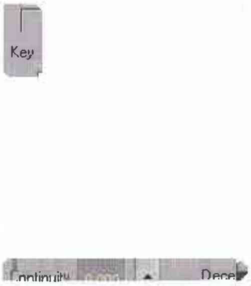

Key
ontinuity
Dece

Figure 10: *Names updated in slider.*

Now we need to rename the effect and the slider to something more descriptive, also. Go to the File TAB > Name sub-tab. Select Value:MotionBlender in the Item List and type "facial" for its new name but then hit the TAB key, not the ENTER key. (There is a bug in LW that causes messiah to think a name has already been used. Using TAB, the bug is circumvented.) Rename ValueControl to EMOTION_POSES.

In the Item List, select Facial:MotionBlender and drag it out of the bone hierarchy. Place it at the top of the other MotionBlender effects. (see Figure 11.) This is a more convenient place to access the control. It allows you to collapse the skeleton if you desire. It is also important to remove it from the hierarchy under the face_null because if you didn't, any position the sliders were in would be considered part of the pose when you start using some of the advanced features later on and we don't want that.

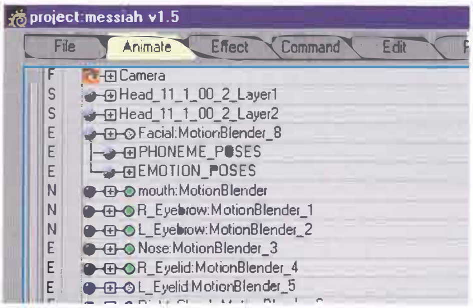

project:messiah v1.5
File
Animate
Effect
Command
Edit
F
S
S
E
E
E
N
N
N
E
E
E
Camera
Head_11_1_00_2_Layer1
Head_11_1_00_2_Layer2
Facial:MotionBlender_8
PHONEME_POSES
EMOTION_POSES
mouth:MotionBlender
R_Eyebrow:MotionBlender_1
L_Eyebrow:MotionBlender_2
Nose:MotionBlender_3
R_Eyelid:MotionBlender_4
L_Eyelid:MotionBlender_5

Figure 11: *Facial:MotionBlender at top of hierarchy.*

Now let's add a second slider for phoneme poses. Return to the Animate TAB. Select Facial:MotionBlender. Click the Setup sub-tab. Create the second slider by again clicking Create Value Slider.

A new slider named ValueControl appears and is selected. Turn off channels 4, 5, and 6 on this one, too.

Enter -22 for Value 1, -23 for Value 2, and -24 for Value 3.

Select the Keys sub-tab. Rename Value_1 to MBP, Value_2 to oooo_U, and Value_3 to AI. I always like to name my phoneme channels after the sounds they are used for.

Go to the File TAB, Name sub-tab and rename this slider to PHONEME_POSES. Remember to hit TAB and not ENTER. (See Figure 12.) Save your work.

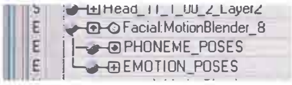

S
E
E
E
Head_11_1_00_2_Layer2
Facial:MotionBlender_8
PHONEME_POSES
EMOTION_POSES

Figure 12.

As you have probably already seen or assumed, I included several pre-made poses with the scene. At frame -10, I used the bone controls to form a smile pose, an angry pose at frame -11, and so on for the other poses. You can have as many poses as you need, but make the poses in negative key ranges. This keeps the poses out of the way of your animation. Remember to use the sliders at frame 0 or higher to avoid common errors. So go frame 0, go to the Animate TAB and test out your poses with the EMOTION_POSES and PHONEME_POSES sliders.

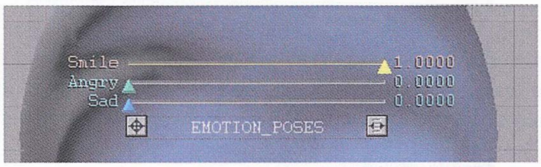
Basic Keyframing For Pose Sliders

Let's continue where we left off. For keyframing sliders, my recommendation is to use independent mode only. This seems natural to me and avoids getting unwanted keys under your other pose channels. To make sure you're in independent mode, look at the lower right corner of the animation window. If you don't see independent displayed, press the "g" key until you do. (See Figure 13.)

Figure 13.

As an example for this section, we're going to play around with our existing poses. I want the character's face to change from a smile to angry over the course of 24 frames.

Go to frame 10. Select the EMOTION_POSES slider. Grab the Smile channel control and slide it all the way to the right. (See Figure 14.) (With sliders you can think of 0.0 as being analogous with 0% and 1.0 with 100%.) Now click on the Angry channel but DO NOT move it. Its channel control should be selected. Left-click create to make a key. This locks Angry to 0.0 at frame 10. If you didn't do this and then keyframed it later to 1.0, messiah would interpolate from frame 0 to frame 34 and give you unexpected results.

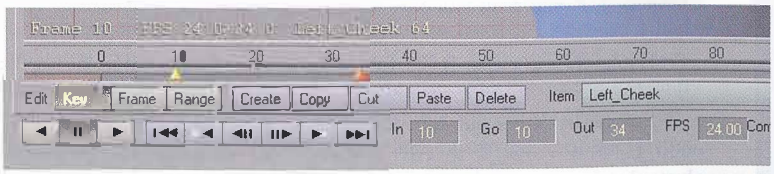


Smile 1.0000
Angry 0.0000
Sad 0.0000

Figure 14.

Now go to frame 34. With the Angry channel still selected, slide it all the way to the right. Its value will be 1.0. Before you panic at the pose you see, grab the Smile channel control and slide it all the way to the left, to 0.0. Now it should look much better. Remember that MotionBlender is additive by default so what was happening was it applied the motion of Smile and Angry on top of each other.

Set the In Point to 10 and the Out Point to 34. Press the PLAY button and watch the transition between poses. (See Figure 15.)



Frame 10

Item Left_Cheek

In 10

Go 10

Out 34

FPS 24.00

Figure 15.

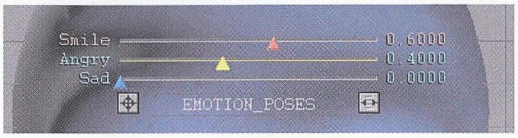
Layering MotionBlender

Layering is a great feature of MotionBlender. With it you can add subtle details to your animation without having to make a completely new pose. Say you have an Angry pose but at a certain point in the animation you want the eyebrows to press down even farther. You can accomplish this with several methods. You could: A: Make a completely new pose and use it in place of your original Angry pose. Maybe call it Angrier. B: Grab the eyebrow bones manually and move them down. This is usually satisfactory for adjustments to a single bone. C: Use just an eyebrow pose to put the brow right where you want it. The benefit of this method is that you can layer the action of whole groups of bones because it's another complete pose. Now you know why I have all those other MotionBlender effects set up with the facial bone groups. Their pose sets are made expressly for this purpose.

Go to frame 10. I like the smile pose there but I want to add some eyebrow movement on top of it. Select the L_BROW_POSES slider. Adjust the Brow_UP channel to raise the eyebrow. Feel free to experiment with the other channels. The thing to remember is that when I built these pose groups I applied MotionBlender to the left_eyebrow_null, so that is the only bone branch it affects. Notice how the layering only affects the left eyebrow. The rest of the Smile pose is left untouched.

Blending Poses

If not still there, go to frame 10 again. Select the EMOTION_POSES slider and slide the Smile channel until it is set at .60. Slide the Angry channel to .40. Leave the Sad channel at 0.0. (See Figure 16.) Now select the L_BROW_POSES slider and only use the Brow_UP channel, setting it at .50. I like this pose and I've decided that I want to add it to our pose set.

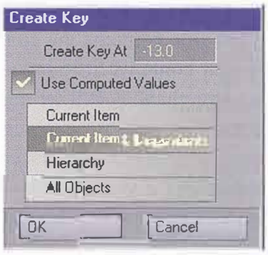


Smile 0.6000
Angry 0.4000
Sad 0.0000

Figure 16.

Staying at frame 10, select the face_null. Click anywhere in the animation window to make it active.

Hit the ENTER key. The Create Key requester appears. Change the Create Key At value to -13. (See Figure 17.)



Create Key

Create Key At -13.0

☑ Use Computed Values

Current Item
Current Item & Descendants
Hierarchy
All Objects

Figure 17.

Make certain that Use Computed Values and Current Item & Descendants are both ON. Click OK.

What did that just do? Well, by using Computed Values, messiah has just keyframed all of the bones in the pose at frame 10 and placed that new pose at frame -13. It keyframed the bones based on their positions after any effects and expressions had been applied. It's basically a WYSIWYG (what you see is what you get) keyframing feature and it is indispensable.

Go to frame -13. The new blended pose has been stored and is ready to be used by MotionBlender.

Go back to frame 10. While still under the Animate tab, select EMOTION_POSES and put it in Setup Mode. Turn channel 4 On. Enter -13 for Value 4.

Put the slider back in Keys Mode.

Rename Value_4 to Oh_Yeah!?

Because you're still at frame 10, you're still seeing the Oh_Yeah!? pose in its blended version. Slide the Smile and the Angry channels back down to 0.0.

Select L_BROW_POSES and slide the Brow_UP channel down to 0.0, also. Now the face is back in its neutral pose.

Select EMOTION_POSES again and slide the Oh_Yeah!? channel up to 1.0. (See Figure 18.) See how easy it was to turn that blended pose into another addition for your pose library?

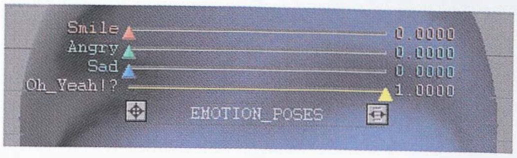

Smile
Angry
Sad
Oh_Yeah!?
0.0000
0.0000
0.0000
1.0000
EMOTION_POSES

Figure 18.

What if you want to change a pose after you start animating? For this example, let us say that you've decided that the right eyebrow should be lower in the Oh_Yeah!? pose. This is easy to do. Go to frame -13 where the pose is stored and select the RIGHT_EYEBROW bone that is in the right_eyebrow_null group. (See Figure 19.)

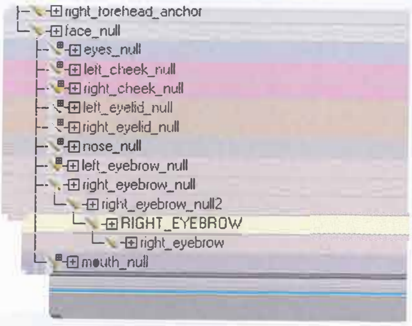

right_forehead_anchor
face_null
eyes_null
left_cheek_null
right_cheek_null
left_eyelid_null
right_eyelid_null
nose_null
left_eyebrow_null
right_eyebrow_null
right_eyebrow_null2
RIGHT_EYEBROW
right_eyebrow
mouth_null

Figure 19.

Rotate its pitch channel and lower the right eyebrow until you're satisfied with the way it looks. That's it!

Now return to frame 10. The pose has automatically updated.

What if you had a little different situation in your animation? This one is applicable if you want to make a pose change for just a short period in your animation. Pretend that you've used the Oh_Yeah!? pose at 5 different places in your animation but, at one of those places you want that right eyebrow back up. It seems like a waste to make an entirely new pose and channel setup just for that one time that you need it. Well, you could layer some right eyebrow MotionBlender motion on top of it - OR - for an easy situation like this, just select the RIGHT_EYEBROW bone at frame 10 and rotate it back up on pitch. This keyframes the change on top of the MotionBlender pose.

Save your work. You're done with this part.

There is a separate facial setup included, face_morphing.fxs. This scene is similar to the scene used earlier, but with one significant difference in how the bones have been arranged. This bone system is set up to work more like traditional morph building. Most of the bones are translated instead of rotated to build the poses, and there is not as much emphasis on keeping the skin moving in arcing paths. This is just another method of using MotionBlender that may be more natural to an animator who is accustomed to building linear-based morphs. However, this setup is still using bones, and it has all the advantages that MotionBlender and messiah bring to your arsenal.

Hands And Layering

MotionBlender can just as easily be applied to hands. Load the example scene hand_setup.fxs into messiah. Though a simpler skeleton, the process of applying MotionBlender to the hand follows the same procedure. The overall parent of the entire hand is the hand_null. Each finger has its own null and there is a thumb_null. This setup allows you to layer motion onto the fingers and thumb, independent of the current pose.

Experiment with this scene. Try out the pose sliders and look at the different poses that have been built in negative key ranges. Practice layering with the pose sliders for the individual fingers and thumb. With layering, you can have a fist pose, but then uncurl individual fingers on top of MotionBlender. For each finger there are also curl poses to use in layering. Just take your time and examine everything. Everything that you need to know about MotionBlender is in this scene.

Adding Anticipation and Follow Through

This next tutorial shows you how to animate a simple tail with MotionBlender, then layer some anticipation and follow-through on top of the MotionBlender animation. There are two sequences of animation that you will examine. They are both the same, but one includes layering and one does not. This way you will be able to see the difference and apply it to your own work.

Load tail_setup.fxs. Go to the Top View and make sure that all the bones are visible so you can see them during the project. (See Figure 20.)

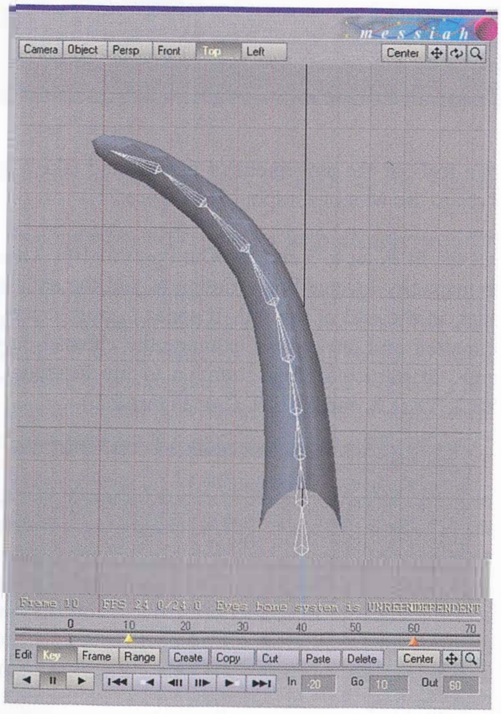
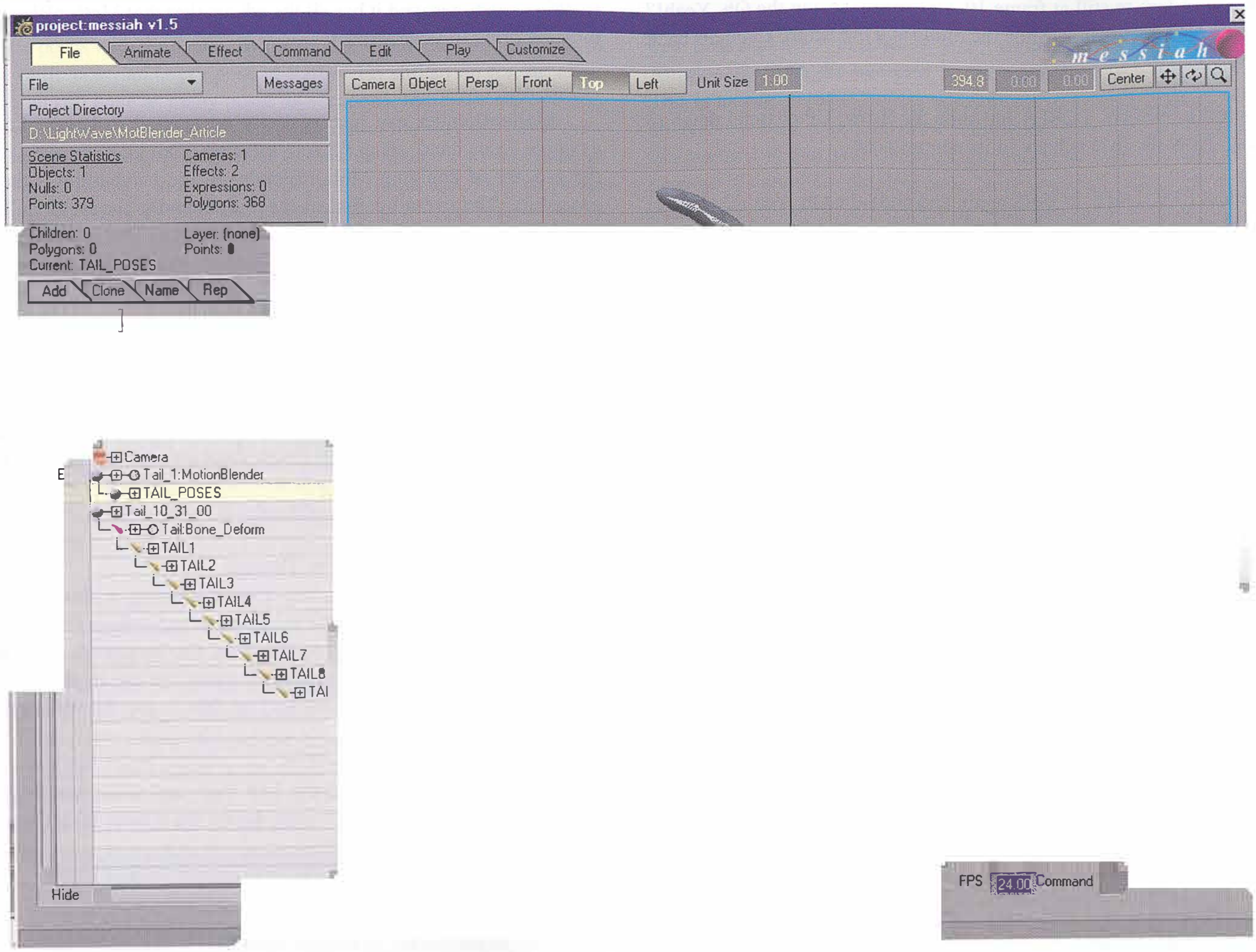

messiah
Camera
Object
Persp
Front
Top
Left
Center
Frame 10
FPS 24 0/24 0
Eyes bone system is UNREERIDEPENDENT
0
10
20
30
40
50
60
70
Edit
Key
Frame
Range
Create
Copy
Cut
Paste
Delete
Center
In
-20
Go
10
Out
60

Figure 20.

Set the In Point to 110 and the Out Point to 205. Play the animation. This is a short animation that uses the MotionBlender channels only. It doesn't look too bad, but all of the bones are rotating on the same key. The tip of a real tail would lag behind during the direction changes, and we also need some anticipation to the start of the tail swing and some follow-through motion where the tail stops. Watch this animation several


project:messiah v1.5
File
Animate
Effect
Command
Edit
Play
Customize
messiah
File
Messages
Camera
Object
Persp
Front
Top
Left
Center
Add
Clone
Name
Rep
Hide
FPS
Command
Camera
Tail_1:MotionBlender
TAIL_POSES
Tail_10_31_00
Tail:Bone_Deform
TAIL1
TAIL2
TAIL3
TAIL4
TAIL5
TAIL6
TAIL7
TAIL8
TAI

Unit Size 1.00

394.8 0.00 0.00

Project Directory
D:\LightWave\MotBlender_Article

Scene Statistics
Objects: 1
Nulls: 0
Points: 379
Cameras: 1
Effects: 2
Expressions: 0
Polygons: 368

Children: 0
Polygons: 0
Current: TAIL_POSES
Layer: (none)
Points: 0

FPS 24.00

Figure 21.

times to get a feel for the movement of the tail and take a look at the channel curves in the Motion Graph. (See Figure 21.)

Now set the In Point to 5 and the Out Point to 100. This sequence contains the manually layered bone motion to add the anticipation and follow-through in the end of the tail. It appears more natural looking. Play the animation and once again examine the channel curves in the Motion Graph. In particular, pay attention to the heading curves for TAIL6, TAIL7, TAIL8, and TAIL9. (See Figure 22.)

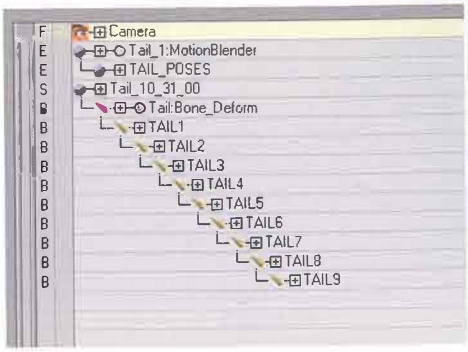

F
E
E
S
B
B
B
B
B
B
B
B
B
B
Camera
Tail_1:MotionBlender
TAIL_POSES
Tail_10_31_00
Tail:Bone_Deform
TAIL1
TAIL2
TAIL3
TAIL4
TAIL5
TAIL6
TAIL7
TAIL8
TAIL9

Figure 22.

For the majority of your work MotionBlender will be sufficient but, for those times when you need to add that last little bit of magic remember that it also gives you the ability to manually layer in bone motion at any point in your animation.

Summary

The demonstrations I have supplied only scratch the surface of what is possible with messiah and the MotionBlender effect. I hope this tutorial has shown you just how easy it can be to utilize bone-morphing in your own projects. When you get ready to animate your own character, unleash your imagination and think where MotionBlender can save you time and provide an easier method for you to utilize. Then, you can let the software do the work and concentrate on the reason you got messiah in the first place - so you can let the character perform.

For more information on Project:messiah and MotionBlender, please visit their website at www.projectmessiah.com. A special thanks to Fred Tepper of the Project:messiah team. His help, insight and encouragement were indispensable during the completion of this tutorial.

When Ron Wolfe is not busy working at his full-time job in a professional fire department, he enjoys working with LightWave and especially, Project:messiah. He stays busy with many free-lance projects involving character modeling, setup and animation for various small companies and individuals. He is always lurking on the LightWave and Project:messiah egroups lists. To contact him with questions and comments, feel free to email him at vrkaya@bright.net. And keep in mind that if he doesn't get back to you in rapid fashion, that something in Ohio may be burning.

Continued from page 17

look false, or computer generated. As the character moved around I had the camera lag, ever so slightly, behind his movements. I just put myself in the cameraman's position and envisioned myself saying, "Where the hell is he going now!"

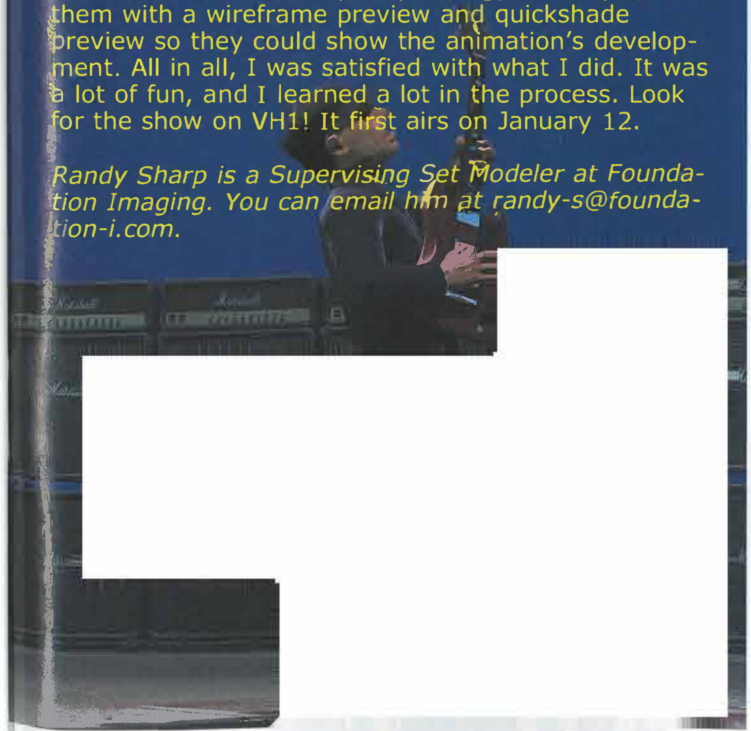
There is only one main spotlight in the scene. It is positioned above the stage. I animated it the same way I animated the camera - very subtle lag behind the character with a quick movement to catch up to him as he moved around. This really helped sell the animation as it makes it look like you have someone above controlling the spotlight.

I added numerous fill lights to the scene as well, including three lights that were parented to the character. These lights were used to specifically light the character and pop him out of the set a bit. Without them he was too dark and blended in with the set too much.

The last thing I did for the animation was to create the hair. I chose Sasquatch to do the hair, but I could have easily used Shave and a Haircut to do the same thing. I created the guide chains and added them to the character in layout. To get them to stick to the character, I had to duplicate the bone structure that was used on his head; and I used Prem's Relativity to "snap" it in place. Once the hair was placed correctly, I used Motion Designer to add the dynamics. After I achieved a satisfactory result with Motion designer I spent quite a bit of time to get the hair to light correctly. This is more difficult than it sounds; luckily, Sasquatch has the "Special Lights" option enabling me to boost/reduce certain lights to get the desired effect.

The animation was delivered to the director and producer in time for them to cut it into the show (which was a good thing; otherwise, my part of the show would have been pretty boring). I also provided them with a wireframe preview and quickshade preview so they could show the animation's development. All in all, I was satisfied with what I did. It was a lot of fun, and I learned a lot in the process. Look for the show on VH1! It first airs on January 12.

Randy Sharp is a Supervising Set Modeler at Foundation Imaging. You can email him at randy-s@foundation-i.com.



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usoffice@righthemisphere.com
www.us.textureweapons.com

Price: $495

Reviewed by Kim Oravecz

If you spend any time at all doing texture mapping on 3D objects, go out and buy Texture Weapons right now! You won't be sorry. Don't even continue reading this review. Don't want to just take my word for it? Then by all means, read on.

Texture Weapons comes on one CD-ROM that contains the program as well as the reference manual and a tutorial in PDF format. Recently, Right Hemisphere has posted four excellent tutorials written by a member of their staff. I learned a lot from these tutorials with very little frustration. The Right Hemisphere website also has the Texture Weapons manual available as a download.

I'm very happy with the Right Hemisphere tech support. They are very prompt in returning e-mails and in keeping you up-to-date with the status of your problem as they are working on it.

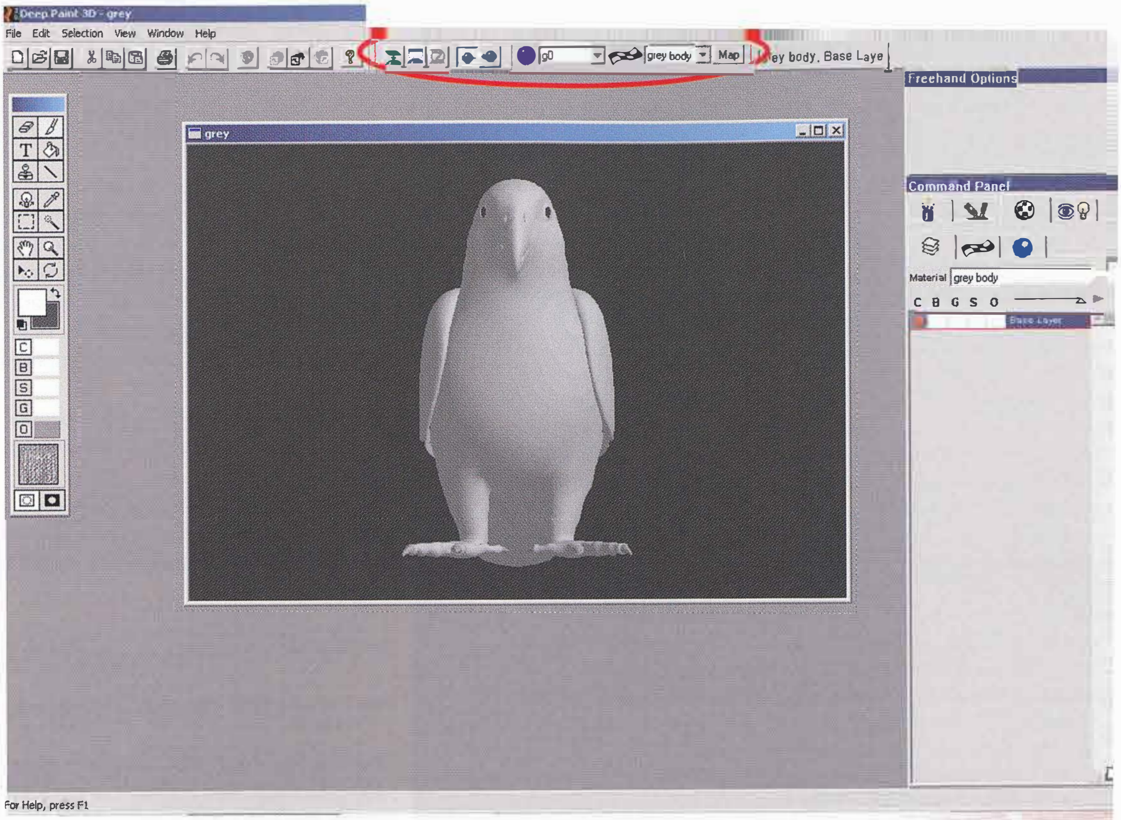
Deep Paint 3D - grey
File Edit Selection View Window Help
g0
grey body
Map
grey body, Base Laye
Freehand Options
Command Panel
Material grey body
C B G S O
Base Layer
grey
C
B
S
G
O
For Help, press F1

Figure 1: Deep Paint 3D interface with additional Texture Weapons controls circled in red.

You have to have Deep Paint 3D in order to install and use Texture Weapons. Texture Weapons basically adds functionality to the Deep Paint 3D program. The new functions Texture Weapons adds that I am going to discuss here are the Mercator Mapping feature and Projection Paint. Mercator enables you to set up your UV mapping on the object and Project Paint enables you to paint on that newly mapped object.

After you have installed Texture Weapons, you will notice a few new icons on the tool bar at the top of your screen (See Figure 1). The first 5 icons are your new projection paint tools. The last couple of items are for selecting your object and surface names for using the Mercator mapping function.

To use Texture Weapons, set up the initial UV mapping for your object in LightWave, load your LightWave object into Deep Paint 3D, select the object name and surface name at the top of the screen and then click on the map button (See Figure 2).

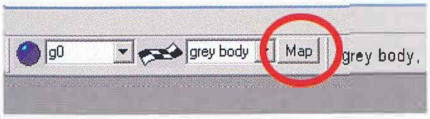
g0
grey body
Map
grey body,

Figure 2: Map button circled.

One of the awesome options in the Mercator mapping function is the V.A.M.P. (Variable Angle Multi Patch) mapping. V.A.M.P. mapping will examine your object and split it up into individual pieces that can be planar mapped for zero distortion mapping! Simply select all polygons (by clicking on the "Select All" button) and then click on the "Map" button. You will see a dialog box asking what type of mapping you wish to perform (See Figure 3). Click on the V.A.M.P. button and you will be

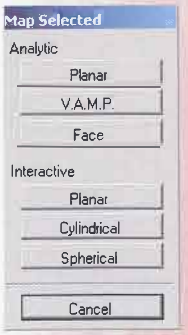
Map Selected
Analytic
Planar
V.A.M.P.
Face
Interactive
Planar
Cylindrical
Spherical
Cancel

Figure 3: Mapping types.

Continued on page 28

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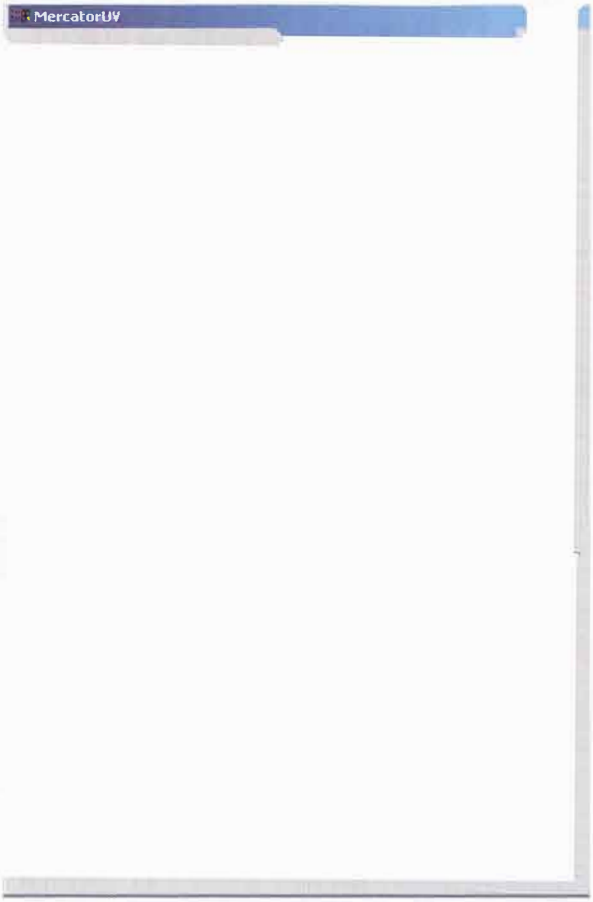

Figure 4: Mercator interface with Interactive Cylindrical mapping.

presented with a slider to select the amount of distortion you will accept. You can select a value between 0 and 180. A value of 0 will give you zero distortion by splitting your object mapping into each and every polygon in your object laid out on the mapping plane. This may be a bit extreme. A value of 180 will give you fewer seams in your mapping but will increase the distortion of your mapping.

The next step is to "pack" your mapping onto the bitmap area. This will move the polygons around on the mapping area to get the most efficient use of mapping space for your object. There are five different options in the dialog box for the packing to give you control over how the mapping is packed. The "better" checkbox will do the best packing for you with the least amount of spacing between groups. However, according to the documentation, selecting this option can increase the amount of time for packing objects over 30,000 polygons to several hours.

The African Grey object is approximately 20,000 polygons. It took about 3 minutes for the program to perform the V.A.M.P. mapping, and another minute to pack the mapping onto the bitmap area (with the "better" option not selected). Considering the amount of time that it would take to do this by hand in LightWave, I'm not complaining!

Mercator enables you to select different portions of your object and to apply different mapping methods on each. In the case of the bird object, the wings and the tail are very good candidates for V.A.M.P. mapping. The body, head and legs, however, are better suited for simple cylindrical mapping. Splitting up your mapping in this way can give you more efficient use of mapping space, because the V.A.M.P. mapping can leave a lot of unused, empty bitmap space.

Mercator has some very cool tools for setting up other types of mapping (such as cylindrical, spherical and planar), which can be used by selecting the Interactive options. Look at the bird's body by selecting the Interactive Cylindrical mapping function. Figure 4 shows the interface after selecting Interactive Cylindrical mapping and taking the menu option Align View->Right. You can see 3 different color spheres on the right-side view. These balls enable you to adjust your mapping: the red ball moves the center of the projection of your mapping, the yellow ball moves the axis of projection, and the blue ball rotates and adjusts where the mapping seam will be. The left side view shows how your surface is mapping out.

Figure 5 shows what the mapping looks like after I made adjustments to the mapping center and axis of projection by moving the red and yellow balls. I did not need to adjust where the seam is, because I wanted the seam to be in the back of the body.

One other mapping option provided is the "Lift" function. This will split an object's mapping in half using two planar maps. For example, the bird's foot could be done in this manner. The Lift function splits the mapping into top and bottom, enabling you to paint a different texture on the bottom and tops of the feet. (See Figure 6.)

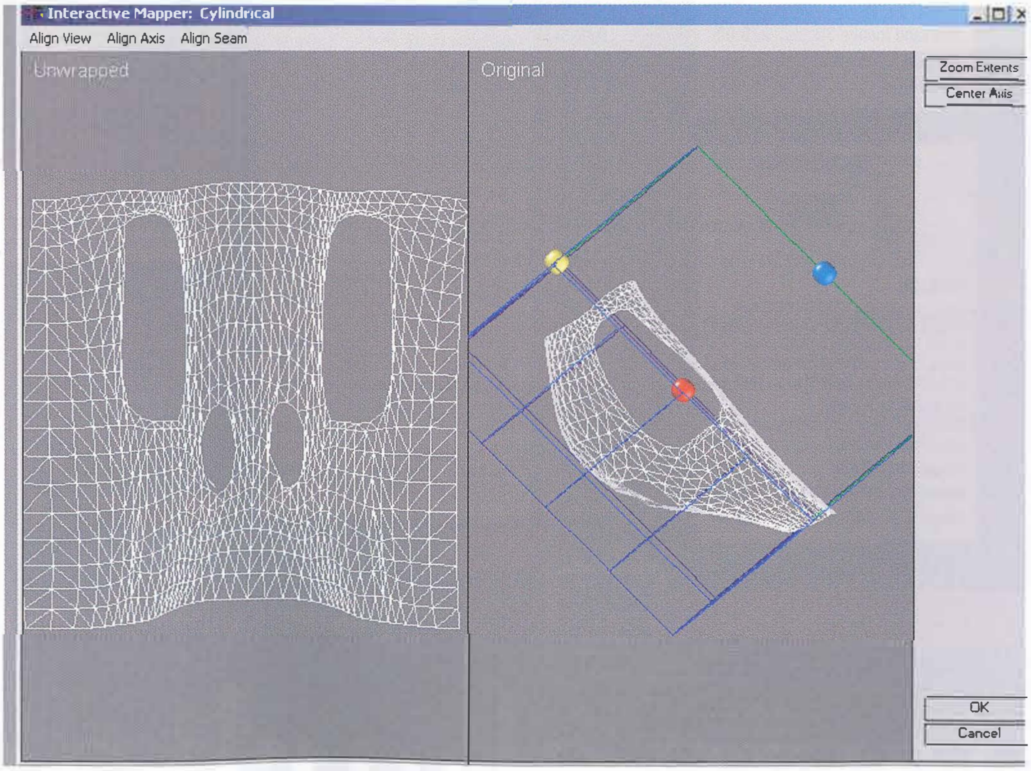

Figure 5: Mapping after adjustments to mapping center and axis of projection.

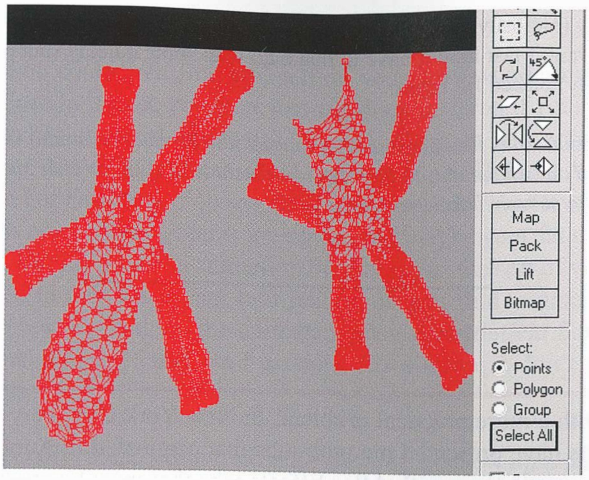

Figure 6: *Lift function splits mapping into top and bottom.*

Mercator includes lots of tools for tweaking your UV mapping including point, polygon and group selection tools; rotate; shear; scale; flip horizontal and vertical; cut; and weld tools.

Once mapping is done, you can click on the OK button to return to the Deep Paint 3D main screen. Because the Mercator mapping creates discontinuous UV mapping, you must use the Projection Paint mode to be able to paint across those seams. This process includes clicking on the projection paint icon at the top of the screen, selecting your paint type, and painting on your object. Another great feature of Projection Paint is that it enables you to paint across areas of distortion without the image map becoming distorted (areas like noses are a good example). The Projection Paint mode actually distorts the 2D image so when it is projected onto the 3D object you will not see any distortion! This mode also enables you to paint continuously across seams without interruption of the image.

As a side note, Mercator splits up your object and unwelds points at the texture seams. And because Mercator creates this discontinuous UV mapping (which creates multiple UV values per vertex at the seams), version 6.0b of LightWave cannot handle this discontinuity and therefore you see many errors at the texture seams. Version 6.5 of LightWave, however, does handle the discontinuous mapping; and therefore, there are no seam problems. At the time of this writing, version 6.5 was not available to the general public but Chris Blanos on the LightWave Beta Force, did some test renders for me to make sure the mapping came out okay. I was very relieved to see the mapping looked great at the seams!

After using Texture Weapons, I am absolutely spoiled. I can't see texture mapping any other way. Now I am even more anxious for the LightWave 6.5 update!

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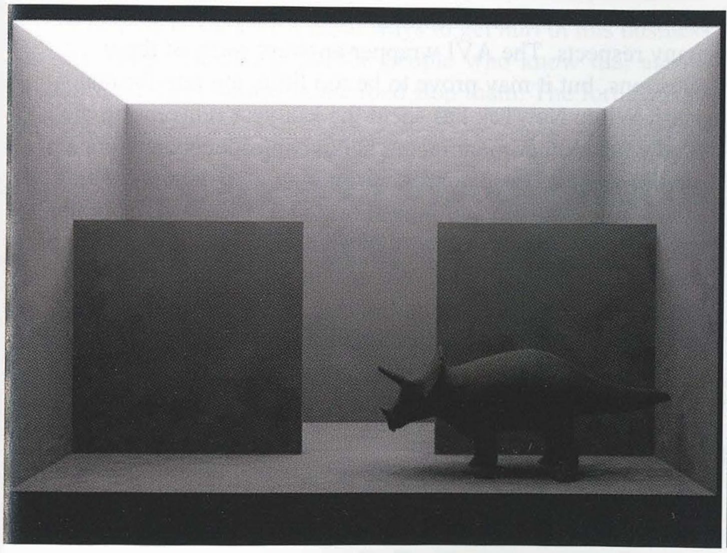

Figure 6: 150% luminous ceiling with radiosity.

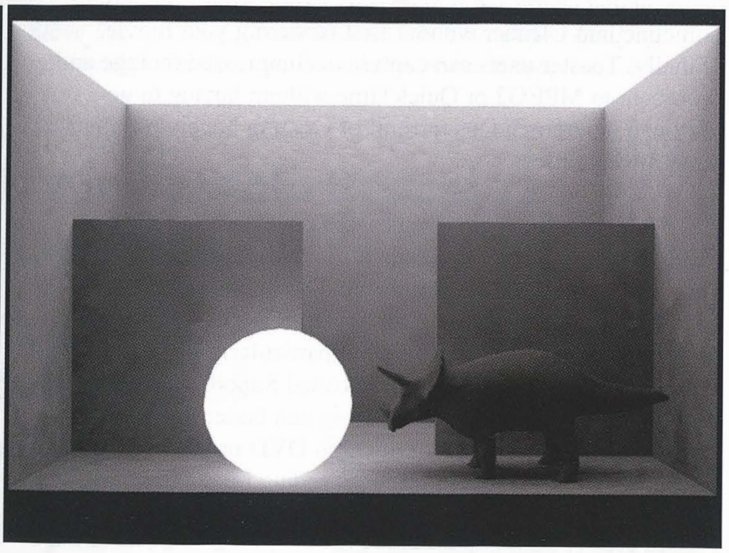

Figure 7: 150% luminous sphere with radiosity.

Okay, set the baffles back to 0% luminosity and ramp up the ceiling luminosity to 150%. Now we see in Figure 6 that the light falls softly about the objects in the room like an area light. Although the fluffy quality is still there from the tolerance setting, if you render overnight you could get a pretty error-free illumination without any of the fluff.

Cool, so can an illuminated object be any shape? What about a sphere? You betcha. Make a ball of about 500mm and put it in the room next to the Triceratops. Make the ball's luminosity equal to about 150% and see how it shines (Figure 7) and even fills in the dinosaur a bit. Note too how the luminosity of the sphere interacts with that of the ceiling panel.

Lighting set-ups with radiosity open up a whole new ballgame. You can light 3D scenes in the same way that you light real life photography. I have an advantage in this respect as I used to do this for a living, real world photography that is. I find it is invaluable to be able to place lights as you would in a real studio and get the same effects. If you don't have any photographic studio experience there are plenty of books that contain all the information. Time spent learning about cinematography, still photography and studio lighting is always time well spent.

Radiosity is a really cool feature of LightWave [6], and well worth the upgrade.

So What?

What have we learned about radiosity in this article? We know that it is not a cure-all, and will not work for all scenes. By all means try it and use it in good health, but don't use it like a hose. We also know that it pays to experiment with the settings. Try it and see what you get, then make a few adjustments to the Tolerance, RPE and MES, to make sure that you are getting the most bang for your bucks.

But I hope that we've also learned that radiosity has limitations. You can't just turn it on and spread class over your 3D work in LightWave. You have to figure if it's worth it before you use it. It might be that you don't have the time to use it. Clients are sort of picky about getting their jobs done on time; they're difficult like that. Arguments that begin "well, it looks much cooler with the radiosity on" go down less well when it'll take the client a couple more weeks to SEE how cool it is. It's the old "speed-quality-price" triangle, where you can only have two of the above. If they're paying big bucks, then they can have quality (radiosity) but it won't be quick. If they're not paying a lot and they want it fast they'll have to make do with some quickly (but professionally) placed fill lights.

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example I can think of is the newly released Cleaner 5 (formerly Media Cleaner Pro). This powerful tool delivers, right now, many of the things Vidget promises for the future, and many things it cannot do at all. The AVI wrapper should let you use RTV clips directly in C5, but I have not tested this. I have been using VTNT with C5 via Premiere and RTV I/O for several months now with excellent results. In case you don't know, Cleaner 5 is a comprehensive tool used primarily for video encoding. This includes QuickTime, AVI, Windows Media, Real media, MPEG1 and MPEG2 among other things. With the latest version, Terran (www.terran.com) includes a plug-in that enables you to directly export your Premiere timeline into Cleaner without first rendering your movie. Finally, Toaster users can capture uncompressed footage and go right out to MPEG2 or QuickTime without having to go through the tremendous turmoil of creating hugely problematic intermediate files.

Additionally, what Cleaner will enable you to do that Vidget seems to have no plans for is to accelerate your encoding with dedicated hardware. Of course, this adds additional expense, but it is all about giving users options, something the stock Toaster is not particularly good at. Terran has introduced a hardware board called SuperCharger that promises speed improvements of 4x and better for MPEG2 encoding, a process that is critical to DVD production. Additionally, Cleaner has a long-standing relationship with the well-known ICE board (www.media100.com/product/ice). This board greatly accelerates many encoding operations including QuickTime codecs like Sorenson 2 and the upcoming Sorenson 3. If you regularly do this type of encoding, the combination of VTNT, Premiere, and ICE'd Cleaner is invaluable. The beauty of uncompressed capture, coupled with the speed and elegance of Cleaner 5, gives you the best possible compressed output for web and CD/DVD distribution.

While we are on the topic of ICE, After Effects is also available in an ICE-accelerated version that dramatically speeds up many effects and operations. NewTek and their supporters would argue that Aura is included with the Toaster for free; however, in its 1.0 state, Aura cannot compete with After Effects feature-for-feature. Another big issue that many people overlook in their comparisons of these types of products has to do with a more practical problem. In New York City, very few clients have presented me with jobs that originated in Aura. Many come to us with After Effects jobs that must be modified, updated, finished, tweaked, whatever. Additionally, finding freelance people who know Aura or Speed Razor is nowhere nearly as easy as finding After Effects or Premiere users.

All of these issues are critical. If the Amiga, the Apple II and Wang have taught us anything, it is that open systems prevail. Had NewTek dedicated resources to opening the VTNT to other NLE platforms early on, the user base would undoubtedly be much greater than it is currently. This larger user base would have meant more money for NewTek and more development for the Toaster. Toaster 2.0 will be a big step forward in many respects. The AVI wrapper answers some of these questions, but it may prove to be too little, too late for many users. While NewTek has spent the last year reinventing the NLE wheel, other manufacturers have introduced new uncompressed systems or lowered their pricing on existing systems. Some have even already moved on to HDTV. NewTek's plan to side-step obsolescence by doing everything in software is great, but where is the software? We need a practical, flexible platform that is here now and ready to go. Many people may doubt this, but I do really want to see NewTek succeed. Unfortunately they seem so determined to make decisions that make success less likely all the time.

You can email Bob Tasa at bobt@vtnt2.com, phone him at 815-254-9431 Tuesday through Friday, or purchase his plug-ins online through Safe Harbor at www.sharbor.com/vendors/TAS.html.

Cleaner and SuperCharger information:
www.terran.com/products/powersuite/

ICE information:
www.media100.com/product/ice

Pipeline Digital (ProVTR):
www.thepipe.com

Jason Goodman is the CEO of NYC-based Multimedia Software Design. You can email him at jason@msd-nyc.com or visit the website, www.msd-nyc.com.

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side, you could well find yourself on your head wondering what happened to the rug you were just standing on. Even if your sugar daddy has the best intentions, though, there is still room for disaster (Steve's Optimism Rule Number Nine: **There Is Always Room For Disaster**). You see, this is Hollywood. Tinseltown. The sort of place where dreams are made, and maybe your fat cat has dreams of his own. An animation facility is just the sort of vehicle needed to turn his dream into reality, so you find yourself and your crew working on the animated musical *Battlefield Earth II: It Gets Worse*. If that isn't a recipe for disaster, I don't know what is.

Finally, there's that tried-and-true way to chew up a facility, bad management. If you ever find yourself with a well-running facility that you want to destroy, simply introduce a new element to its balanced ecosystem: ***EVIL***. OK, so maybe evil is a bit harsh, a better word might be ***POWER***. Get some managers who believe that the best way to guide artists to success is to threaten them with grave bodily harm. Better still, throw in a few guys or gals with a good mix of hidden agendas and Machiavellian underpinnings, and then do nothing to intervene. Skim a good portion of the operating budget, berate people at every opportunity, and wait.

Gosh, there sure are a lot of ways to get hurt in this business. Is it worth it? Hell yes, and the people who know that are not going to let these bumps in the road stop them. The fortunate are able to retain enough flexibility and keep a watchful eye far enough into the future to dodge around the bumps. I believe that Foundation falls into that category, having weathered some rough storms through a combination of things: creative expansion of revenue streams, loyal (and fabulous, and patient) artists, and tremendous sacrifices made by those 'above the line' when need be.

Even those not as fortunate are survivors. Like Phoenix from the ashes, visual effects companies are known for being able to rebuild and resurface. Some reform and continue with business as usual, essentially shaking off the hit with a change of name (and probably a couple of stiff drinks, or maybe that's just what I'd do). Others look at their shakeup as an opportunity to rethink their chosen path, perhaps returning to genres and projects that they had lost touch with when they were too big to consider them. Still, some may not be back. In some cases, though, that's not such a bad thing. I needed more animators anyway.

So fear not, intrepid animator. You may need to update your mailing list for those demo reels, but eventually they'll wind up in the same hands you wanted them in to begin with. We're all still out here, still animating, and still moving forward. Just please, for God's sake, don't use that same Propellerheads song. Doesn't anyone like funk anymore? Kids these days, I tell ya...

Steve Pugh is the General Manager at Foundation Imaging. You can contact him through its website, www.foundation-i.com.

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by Steve Pugh

Admit it, it's your worst nightmare. You scrimp and scratch, save up, and spring for a spankin' new copy of LightWave. You read the books, you watch the tapes, and you even tape episodes of Voyager and skip the scenes with Jeri Ryan. You get your chops up, render out a few animations and cut a demo reel to that gloriously original Propellerheads track. You plunk down in front of the Internet and start assembling a list of all those hot LightWave houses that will hire you the instant they plunk that T-120 into the VCR.

Where'd they all go?

The past year has seen some dramatic movement in the LightWave community, to be sure. Some of the largest and highest-profiled shops have closed their doors, but fear not: upon closer inspection, things are often not what they seem. Funny thing about a lot of the people running animation or VFX shops, they really do love what they do for a living. When you have a certain passion for your work, it's very difficult not to continue, not to start again should something unforeseen occur.

Why was this year in particular so tumultuous? Good question, and the possible answers are more numerous than the companies involved. The common thread, in my mind, has been that bastion of sound business practice, Growth. It is natural, almost mandatory, than any business must grow in order to succeed. The last two years in particular have seen opportunities for many companies, including Foundation Imaging, to grow substantially in a very short period.

That is where the danger lies. Without an incredible combination of restraint and ambition, thought and action, structure and flexibility, rapid expansion can pile an awful lot of straws onto any camel's back. On Starship Troopers alone, three LightWave shops eventually got into the mix, two of which swelled their ranks two or three times in size to carry the workload. Expanding a staff of artists this quickly and substantially is not unlike heating glass - once you've expanded, it is only natural that you are in a fairly delicate state. Outside pressures and internal fluctuations become amplified, and for a little while you lose some of the flexibility you need to bounce rather than break on a production's rough spots.

Another possible route of growth is not without its own risks. These days, the wise effects facility is exploring a whole host of income-generating possibilities, one of which is the tried-and-true option of selling part or all of the company to investors. This sort of thing happens all the time in the rest of the world. Being digital artists, some of the tools we covet require a significant outlay of scratch, and sometimes the only way to get hold of that kind of liquid dinero is to approach the fat cats of the planet.

Sounds great, right? Well, it can be. However, what if that fat cat turns out to be a wolf? There are plenty of Gordon Geckos in the world today, looking to get their hands on your assets. Without a razor-sharp lawyer by your

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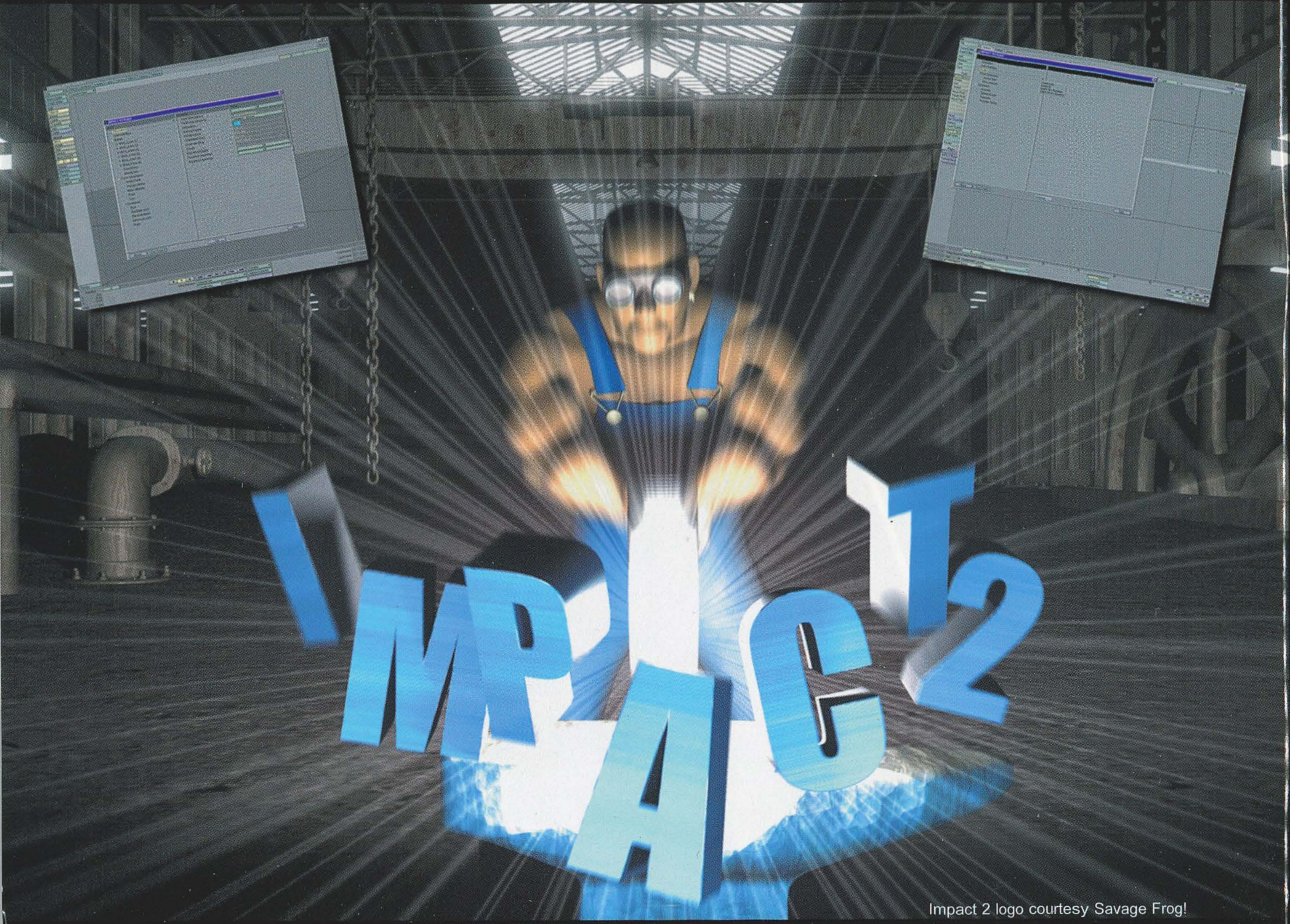

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